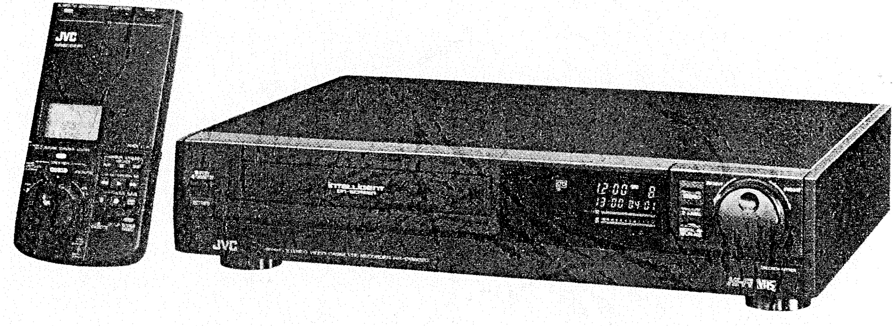
JVC

SERVICE MANUAL

Hi-Fi STEREO VIDEO CASSETTE RECORDER VHS PAL

HR-D960E/EG



SPECIFICATIONS *(The specifications shown pertain specifically to the model HR-D960EG.)*

GENERAL

Power requirement : AC 220 V~, 50/60 Hz
Power consumption : 32 W
Temperature : 5°C to 40°C (Operating)
: −20°C to 60°C (Storage)
Operating position : Horizontal only
Dimensions (WxHxD) : 449 x 95 x 338 mm
Weight : 6.3 kg
Format : VHS PAL standard with Hi-Fi audio
Tape width : 12.65 mm
Tape speed (SP) : 23.39 mm/sec
(LP) : 11.70 mm/sec
Maximum recording time
(SP) : 240 min. with E-240 video cassette
(LP) : 480 min. with E-240 video cassette

VIDEO

Signal system : PAL colour and CCIR monochrome signals, 625 lines/50 fields
Recording system : Rotary two-head helical scan system with a slant double-azimuth combination video head
Input : 0.5 to 2.0 Vp-p, 75 ohms, unbalanced
Output : 1.0 Vp-p, 75 ohms, unbalanced
Signal-to-noise ratio : 43 dB (Rohde & Schwarz noise meter) with BILDSCHÄRFE control at centre position
Horizontal resolution : 250 lines with BILDSCHÄRFE control at centre position

AUDIO

Input : Mic:-67 dBs, high impedance, unbalanced
: AUDIO EING. connector (RCA x 2): -8 dBs, 50 k-ohms, unbalanced
: AUDIO/VIDEO socket (21-pin Peri connector):-3.8 dBs, (CENELEC standard), 10 k-ohms, unbalanced
Output : AUDIO/VIDEO socket (21-pin Peri connector):-3.8 dBs, (CENELEC standard), high-impedance load less than 1 k-ohm, unbalanced
: AUDIO AUSG. connector (RCA x 2): -6 dBs, high-impedance load less than 1 k-ohm, unbalanced (100 k-ohms, load)

NORMAL AUDIO

Recording system : Longitudinal track
No. of audio channels : 1 (monaural)
Frequency range : 70 Hz to 10,000 Hz

Hi-Fi AUDIO

Recording system : Deep-layer recording system conforming to stereo Hi-Fi VHS standard
No. of audio channels : 2 Hi-Fi audio channels
Frequency response : 20 Hz to 20,000 Hz
Dynamic range : More than 90 dB
Wow and flutter : Less than 0.005% WRMS

TUNER

Tuning system : Frequency synthesized tuner
TV channel storage capacity : 48 positions (+ AUX position "AU")
Channel coverage : VHF 47 – 111 MHz
111 – 300 MHz
UHF 470 – 862 MHz
Aerial output : UHF channel 36 (adjustable 32 – 40)

TIMER

Clock reference : Quartz-crystal
Programme capacity : 1-year/8-programme timer
Memory back-up time : 3 min.

ACCESSORIES

Provided accessories : Aerial cable, Infrared remote control unit, "R6" battery x 4, Audio cable (RCA-RCA)
Optional accessories : VPV adapter VU-V120E
VPT adapter VU-V140E

Specifications shown are for SP mode unless otherwise specified.
Design and specifications subject to change without notice.

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No. 82197
August 1990

NOTE: For a technical description, please refer to Technical Guide VTG82056 HR-D960 PAL.

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1. The Instructions shown pertain specifically to the Model HR-D960EG. For detailed descriptions, be sure to consult the Instruction booklets of the other Models.
2. The following table lists the differing points between Models (HR-D960E and HR-D960EG) in this series.

Item \ Model			HR-D960EG	HR-D960E
TV TUNER	Channel coverage	VHF	47 to 111 MHz	← *1)
			111 to 300 MHz	← *1)
			No	302 to 470 MHz
		UHF	470 to 862 MHz	← *1)
TIMER	Memory back-up time		Minimum 3 min	60 min
	VPS		Built-in	Option (VU-V110E)
TELETEXT	VPV		Option (VU-V120E) *2)	Option (VU-V100E) *3)
	VPT (with TOP) *4)		Option (VU-V140E) *2)	Option (VU-V150E) *3)

Notes: **1) ← The same as model at left.* **2) VU-V120E/VU-V140E without VPS*
**3) VU-V100E/VU-V150E with VPS* **4) TOP: Table of page*

Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded (▨) parts are critical for safety.
   Replace only with specified part numbers.
   Note: **Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.**

3. Fuse replacement caution notice.
   Caution for continued protection against fire hazard.
   Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistors
   5) Barrier

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

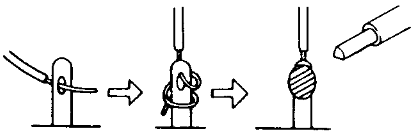


Fig. 1

7. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10–15 kg of force in any direction will not loosen it.

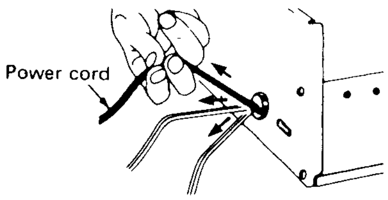


Fig. 2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector
    In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.
    1) **Connector part number** : E03830-001
    2) **Required tool** : Connector crimping tool of the proper type which will not damage insulated parts.
    3) **Replacement procedure**
       (1) Remove the old connector by cutting the wires at a point close to the connector.
       Important : Do not reuse a connector (discard it).

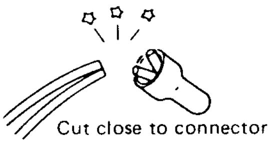


Fig. 3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

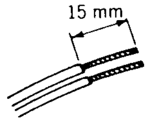


Fig. 4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

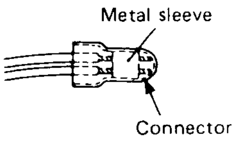


Fig. 5

(4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

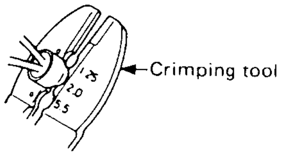


Fig. 6

(5) Check the four points noted in Fig. 7.

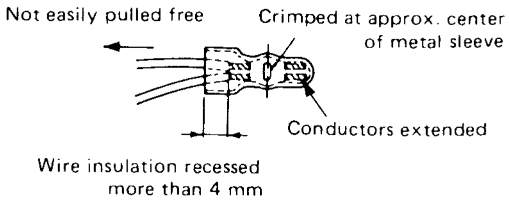

Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig. 7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. **Insulation resistance test**
   Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. **Dielectric strength test**
   Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. **Clearance distance**
   When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

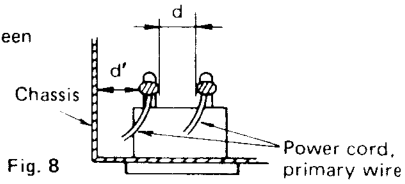


Fig. 8

4. **Leakage current test**
   Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).
   Measuring Method: (Power ON)
   Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

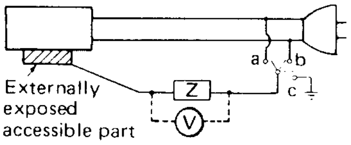


Fig. 9

5. **Grounding (Class I model only)**
   Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).
   Measuring Method:
   Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

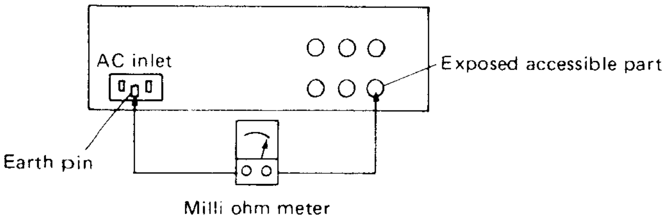


Fig. 10

Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	Z ≦ 0.1 ohm
Europe & Australia	Z ≦ 0.5 ohm

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	R ≧ 1 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3 mm
100 to 240 V			AC 1.5 kV 1 minute	d, d' ≧ 4 mm
110 to 130 V	USA & Canada	–	AC 900 V 1 minute	d, d' ≧ 3.2 mm
110 to 130 V 200 to 240 V	Europe & Australia	R ≧ 10 MΩ /500 V DC	AC 3 kV 1 minute (Class II) AC 1.5 kV 1 minute (Class I)	d ≧ 4 mm d' ≧ 8 mm (Power cord) d' ≧ 6 mm (Primary wire)

Table 1 Specifications for each region

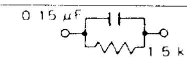
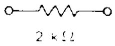
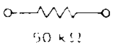
AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	1 kΩ	i ≦ 1 mA rms	Exposed accessible parts
110 to 130 V	USA & Canada	 0.15 μF 1.5 kΩ	i ≦ 0.5 mA rms	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	 2 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Antenna earth terminals
		 50 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Other terminals

Table 2 Leakage current specifications for each region

Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

INSTRUCTIONS

SAFETY PRECAUTIONS

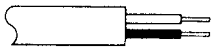
The rating plate and the safety caution are on the rear of the unit.

WARNING — DANGEROUS VOLTAGE INSIDE
WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

IMPORTANT (In the United Kingdom)
Mains Supply (240 V∿, 50 Hz only)

IMPORTANT

Do not make any connection to the Larger Terminal coded E or Green. The wires in the mains lead are coloured in accordance with the following code:



If these colours do not correspond with the terminal identifications of your plug, connect as follows:
Blue wire to terminal coded N (Neutral) or coloured Black.
Brown wire to terminal coded L (Live) or coloured Red.
If in doubt — consult a competent electrician.

Omkopplaren BETRIEB på denna apparat är sekundärt kopplad och skiljer inte apparaten från nätet i läge BETRIEB OFF.

The BETRIEB button does not completely shut off mains power from the unit, but switches operating current on and off.

BEMAERK: I stilling OFF er apparatet stadig forbundet med lysnettet Hvis det ønskes fuldstændig afbrudt skai netledningen trækkes ud.

This unit is produced to comply with Directives 76/889/EEC, 82/499/EEC, 87/308/EEC and Standard IEC Publ. 65.

Video tapes recorded with this video recorder in the LP (Long Play) mode cannot

CAUTION

- When you are not using the recorder for a long period of time, it is recommended that you disconnect the power cord from the AC outlet.
- Dangerous voltage inside. Refer internal servicing to qualified service personnel. To prevent electric shock or fire hazard, remove the power cord from the AC outlet prior to connecting or disconnecting any signal lead or aerial.

WARNING

There are two different types of SECAM colour systems: SECAM-L, used in FRANCE (also called SECAM-West), and SECAM-B, used in the GRD, e.g. (also called SECAM-East).

1. This recorder can also receive SECAM-B colour television signals for recording and playback.
2. Recordings made of SECAM-B television signals produce monochrome pictures if played back on a video recorder of SECAM-L standard, or do not produce normal colour pictures if played back on a PAL video recorder with SECAM-B system incorporated (even if the TV set is SECAM-compatible).
3. SECAM-L prerecorded cassettes or recordings made with a SECAM-L video recorder produce monochrome pictures when played back with this recorder.
4. This recorder cannot be used for the SECAM-L standard. Use a SECAM-L recorder to record SECAM-L signals.

IMPORTANT: It may be unlawful to record or play back copyrighted material without the consent of the copyright owner.

WARNING

The switched AC outlet should not be used for connection of TVs and other apparatus in which unintended switching could result in fire or other hazard.

VHS
PAL
HQ

- Only cassettes marked "VHS" can be used with this video recorder.
- HQ VHS is compatible with existing VHS equipment.

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PRECAUTIONS

VIDEO RECORDER

Handling and storage

- Avoid using the recorder under the following conditions:
  - — extremely hot, cold or humid places,
  - — dusty places,
  - — near appliances generating strong magnetic fields,
  - — places subject to vibrations, and
  - — poorly ventilated places.
- Be careful of moisture condensation.
- Avoid using the recorder immediately after moving from a cold place to a warm place. The water vapour in warm air will condense on the still-cold video head drum and tape guides and may cause damage to the tape and the recorder.
- Handle the recorder carefully
  - • Do not block the ventilation openings.
  - • Do not place anything heavy on the recorder.
  - • Do not place anything which might spill and cause trouble on the top cover of the recorder.
  - • Use in horizontal (flat) position only.
- In case of transportation,
  - • Avoid violent shocks to the recorder during packing and transportation.
  - • Before packing, be sure to remove the cassette from the recorder.

Moisture condensation

- If you pour a cold liquid into a glass, water vapour in the air will condense on the surface of the glass. This is called moisture condensation.
- Moisture condensation on the head drum, one of the most crucial parts of the video recorder, will cause damage to the tape.
- Moisture condensation is apt to occur under the following conditions:
  - — when the recorder is moved from a cold place to a warm place, and
  - — under extremely humid conditions.
- In conditions where moisture condensation may occur, keep the power cord plugged in an AC outlet and the power switched on; this will help prevent condensation from occurring. When condensation has occurred, it will not evaporate quickly once the power is switched on. Wait a few hours for the recorder to become dry.

VIDEO CASSETTES

- Avoid exposing the cassettes to direct sunlight. Keep them away from heaters.
- Avoid extreme humidity, violent vibrations or shocks, strong magnetic fields (near a motor, transformer or magnet) and dusty places.
- Place the cassettes in cassette cases and position vertically.

REMOTE CONTROL UNIT

- Avoid violent shocks, especially take care not to drop the unit.
- Take care not to allow liquid to spill into the unit.
- Do not place heavy objects on the unit.
- Avoid leaving the unit in places subject to direct sunlight or extremely high temperatures.

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FEATURES

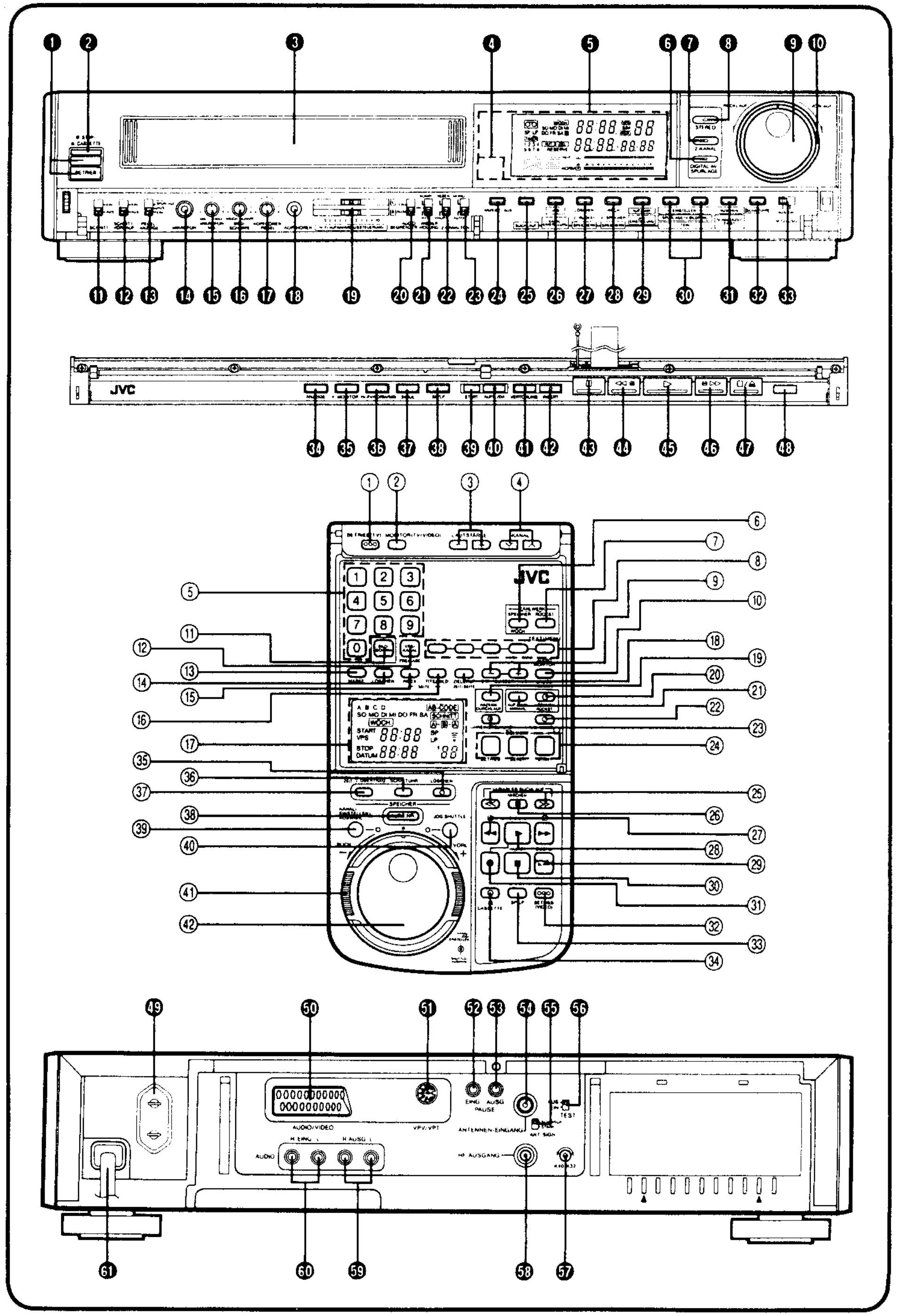
MAIN FEATURES, ADVANTAGES AND BENEFITS

Feature	Advantage	Benefit
DA-4 (Double-Azimuth 4-Head) system	■ SP/LP twin-speed recording with a pair of exclusive video heads. ■ Noiseless stills, frame advance, variable slow and search in both directions are possible.	■ Up to 8 hours of recording on a single cassette (E-240). Flexible special-effects playback in both SP and LP modes.
Hi-Fi VHS system	Stereo sound with a dynamic range of more than 90 dB — outclasses even the finest conventional audio decks and approaches CD quality.	■ Can experience superb "cinematic" sound right in your own living room. ■ Hi-Fi VHS software can be enjoyed with full impact.
Quick-Response Full-Loading Mechanism	■ Quick response: 1.3 seconds from Stop to Play or Record. ■ Increased Rewind/Fast-Forward speed.	■ Immediate, no-frustration operation of VCR. ■ Faster Rewind/Fast-Forward saves time.
Advanced Editing Functions	■ Flying erase head, SCHNITT-VORLAUF switch, and PAUSE FERNBEDIENUNG AUSG. control terminal allow professional-class preroll assemble and insert editing. ■ Jog/Shuttle controls for pin-point location of edit points. ■ Retake function, white fader, and audio dubbing.	You can edit your own videos like a pro.
Jog/Shuttle Remote Control with LCD readout	■ Multi-purpose Jog/Shuttle controls can beused for channel setting, LCD clock and timer setting, as well as for tape search. ■ Built-in 4 independent programme memories make anywhere programming possible for later transfer to the VCR's timer.	Large, easy-to-use- Jog/Shuttle controls greatly improve operability, making your video experience a whole lot better.
Digital AV Tracking	Microcomputer-controlled tracking system maintains constant optimal tracking of the Hi-Fi audio and video tracks.	Best possible picture performance, even for rental videos, is always assured.
Intelligent Blank Search System	Microcomputer-controlled system automatically seeks out the unrecorded portion on a tape (absence of control pulses) and automatically displays tape's remaining time.	■ Makes additional recording onto partially recorded tapes more simple and convenient. ■ Allows more efficient use of tapes.
Intelligent On-Screen Display System	On-screen display system for timer programming and mode check. You can select German, French, Italian, or English for on-screen messages.	■ Easy-to-do, easy-to-see timer programming on the big, bright TV screen. ■ Dual-screen programming convenience n conjunction with remote's LCD.

OTHER KEY FEATURES

Automatic Repeat Playback — Repeat playback of whole tape or segment between two index codes up to 5 times.
VPT Compatibility — Adds extra features such as teletext viewing and simplified timer programming simply by connecting one of JVC's optional teletext adapters (VU-V140E or VU-V150E).
Realtime Go-To — Locates a point a specified time away from the beginning of the tape.
Realtime Search — Locates a point a specified time away from the current position.
Index Search — Automatic location of up to 99 index coded programmes. You can mark/erase index codes.
Intro Search — Plays back the beginning of each indexed programme for about 5 seconds in fast-motion.
Skip Search — Skips unwanted tape segments 1/2 to 2 minutes in length.

Duet Editing — Allows simultaneous control of two JVC VCRs by one remote control when editing.
Flexible timer functions — Timer programming flexibility thanks to 1-year/8-event timer, 24-hour instant timer, and "off" timer.
Instant "summer time" adjustment — One-button adjustment of VCR's clock to and from daylight saving time.
Child Lock system — Temporarily disables VCR's controls to deter unwanted operation.
Audio dubbing — Makes it possible to add a new soundtrack to a video tape without affecting the original Hi-Fi track.
Display OFF function — Can switch off FDP to eliminate bothersome light and reduce chances of theft.



CONTROLS, INDICATORS AND CONNECTORS

Refer to diagrams on the front foldout page.

Front panel

① Operate (BETRIEB) button with LED indicator
Press to apply operating power to the recorder. The LED indicator will light. Loading a cassette also turns the power on.

② Stop/Eject button (STOP/CASSETTE)
- Press while in the Stop mode to eject the tape.
- Press while in other modes to stop the tape.

③ Cassette loading slot
Insert a VHS cassette. The door will close and the "cassette loaded" indicator will appear on the FDP (fluorescent display panel).

④ Infrared beam receiving window

⑤ Fluorescent Display Panel (FDP)

⑥ Digital AV Tracking indicator (DIGITAL-AV-SPURLAGE.)
Lights in the Digital AV Tracking mode. Blinks while adjusting. (See page 59.)

⑦ Bilingual indicator (2-KANAL)
Lights when a bilingual programme is being received.

⑧ STEREO indicator
Lights when a stereo programme is being received.

⑨ JOG dial (inner control)
Use for jog search, for timer and clock setting, and for channel selection. (See page 61.)

⑩ SHUTTTLE ring (outer control)
Use for variable speed search and for timer and clock setting. (See page 61.)

⑪ Edit switch (SCHNITT)
Normally set to OFF. For making multi-generation dubs,set it to the ON position. (See page 75.)

⑫ Pre-roll switch (SCHNITT-VORLAUF)
Set to ON for preroll editing. Normally set to OFF.(See page 75.)

⑬ Level indicator switch (PEGELANZEIGE)
Selects the function of the audio level indications/Hi-Fi tracking meter. (See page 52.)

⑭ Microphone jack (MIKROFON-EING.)

⑮ Microphone mix control (MIKROFON-MIX)
For control of the microphone input level for microphone-mix recording via the MIKROFON-EING. jack ⑭. When making an adjustment, connect a pair of headphones to monitor the input level.

⑯ Picture sharpness control (BILDSCHÄRFE)
Turn this knob clockwise to make the picture sharper. Turn counterclockwise to give the picture a softer tone. Effective only for playback pictures. (No effect on recording.)

⑰ Headphone level control (KOPFHÖRER-PEGEL)
Adjusts the level of audio output from the headphone jack.

⑱ Headphone jack (KOPFHÖRER)

⑲ Hi-Fi audio recording level controls (Hi-Fi AUFNAHMEAUSSTEUERUNG)
Use to adjust the Hi-Fi audio recording level, referring to the audio level indicators on the display panel. (See page 52.)

⑳ Automatic level control switch (AUDIO-BEGRENZER)
Set to AUS when adjusting the hi-fi audio recording level manually.

㉑ Repeat switch (WIEDERHOLUNG)
KOMPL.: To play back the entire tape repeatedly.
INDEX: To play back a segment between two adjacent index codes. (See page 60.)
AUS: No repeat playback.

㉒ TV sound select Main/Sub switch (2-KANALTON HAUPT/NEBEN)
HAUPT: To record the main soundtrack (local language).
NEBEN: To record the sub soundtrack (foreign language). (See pages 51 and 64.)

㉓ Stereo/monaural switch (AUTO/MONO)
Set to MONO when the quality of the stereo sound being received is poor. The broadcast will be received in monaural with improved results. (See page 64.)

㉔ Display off button (ANZEIGE AUS)
To turn off the FDP.

㉕ Search button (SUCHLAUF)
Press to initiate real channel automatic scan tuning. (See page 56.)

㉖ VPS/Channel set button (VPS/KANAL-EINSTELLUNG)
This is a dual-function button.
- as a VPS button — press to enter the VPS command while in the Timer Set mode.
- as a KANAL-EINSTELLUNG button — press to engage the Real Channel mode.

㉗ Cancel/Counter reset/Skip button (LÖSCHEN/ZÄHLWERK-RÜCKST./SPRINGEN)
This is a triple-function button.
- as a LÖSCHEN button — press to cancel the programmed data in the Timer Set mode.
- as a ZÄHLWERK-RÜCKST. button — press to reset the realtime counter reading to "0H 00M 00S".
- as a SPRINGEN button — press to skip unnecessary channels in the Real Channel mode.

㉘ Repeat/Counter memory/Store button (WÖCH./ZÄHLWERK-SPEICHER/SPEICHERN)
This is a triple-function button.
- as a WÖCH. button — press to enter the repeat command in the Timer Set mode.
- as a ZÄHLWERK-SPEICHER button — press to engage the Counter Memory mode.
- as a SPEICHERN button — press to store the tuned-in channel in the Real Channel mode.

㉙ Programme/Clock adjust button (AUFZ. NR./UHREINSTELLUNG)
Press to change the recorder's mode in the following order: Clock mode, Timer Set mode, Clock Set mode, then return to the Clock mode.

㉚ Set/Tracking/Vertical lock/Fine (-/+) buttons (EINSTELLEN/SPURLAGE/V-BILDFANG/FEIN)
These buttons have five functions.
- as EINSTELLEN buttons — press to set the correct data in the Clock Set or Timer Set or Channel Set mode.
- as SPURLAGE buttons — press both to cancel the automatic Digital AV Tracking mode, then press either for manual tracking control. (See page 59.)
- as V-BILDFANG buttons — press either to reduce vertical vibrations, if observed in the Still mode.
- as FEIN buttons — press to shift the frequency in either direction to fine-tune in a specific station in the Real Channel mode.

㉛ Select/Summer time adjust button (AUSWAHL/SOMMERZEIT EINST.)
This is a dual-function button.
- as a AUSWAHL button — press to select the item to be set in the Clock Set, Real Channel or Timer Set mode.
- as a SOMMERZEIT EINST. button — press and quickly release to advance the clock by one hour, hold it pressed for 2 seconds to set the clock back by one hour (See page 53.)

㉜ Timer button (SCHALTUHR)
Press to engage the Timer Standby mode.

㉝ AC online switch (NETZAUSGANG)
AUS position: Power is available from the rear panel AC outlet regardless of whether the recorder is on or off.
EIN position: Power is available from the rear panel AC outlet only when the recorder is on. When used in combination with the built-in timer, this enables timer-controlled power supply for the connected equipment.

㉞ Display button (ANZEIGE)
Press to switch the display between the realtime tape counter, remaining tape time, and date. Also press to change the display from the Timer Set mode to the Clock mode.

㉟ AUDIO MONITOR button
Each time this button is pressed, the audio channel to be output changes and is indicated by the L and R indicators on the FDP. (See page 52.)

㊱ Audio mix button (HI-FI/NORM/MIX)
Press to select for listening among either the hi-fi or normal soundtracks or a mixture of the two. (See page 52.)

㊲ Simulcast button (SIMUL)
When recording FM simulcast TV programmes, press this button (anytime, except when in the AUX mode) to set to the simulcast mode. "SIM" will light on the FDP, and the video from the built-in tuner and the hi-fi audio signals from the rear panel AUDIO EING. connectors will be recorded. (See page 64.)

㊳ SP/LP button
Press to select the recording speed (SP or LP).

㊴ START button
Press to engage the 24-Hour Instant Timer Set mode. (See page 66.)

㊵ Record/Instant Timer Record button (AUFN./DA)
- Press once to start recording.
- Press twice to engage the Instant Timer Recording mode.
- Also use to set the required recording time in the 24-Hour Instant Timer Set mode.

㊶ Audio dubbing button (VERTONUNG)
Press while in the Still mode, then press the WIEDERG. button ㊺ to start audio dubbing.

㊷ Insert button (INSERT)
Press for insert editing. (See page 76.)

㊸ Pause/Still button (PAUSE/STANDB.)
- Press while in the Record mode to stop the tape temporarily to avoid recording of unwanted material.
- Press while in the Play mode to view a still picture.
- The still picture can be advanced each time this button is pressed.

㊹ Rewind/Shuttle Search button (RÜCKLAUF)
- *Press while in the Stop mode to rewind the tape.*
- Press while in the Play mode for Shuttle Search in the reverse direction.

㊺ Play button (WIEDERG.)
- Press to play back a tape.
- Press to cancel the Pause/Still or Shuttle Search mode (See page 62.)
- Press to start recording from the Record-Pause mode.
- Press to start audio dubbing from the Audio Dub Standby mode.

㊻ Fast-Forward/Shuttle Search button (VORLAUF)
- Press while in the Stop mode to fast-forward the tape.
- Press while in the Play mode for Shuttle Search in the forward direction.

㊼ Stop/Eject button (STOP/CASSETTE)
Functions same as ②.

㊽ FADER button
Press to apply either white fade-in or fade-out effects. (See page 76.)

Rear Panel

㊾ AC outlet (GESCHALTET)
Connect the power cord of other audio or video equipment (such as an FM tuner) requiring less than 2 amperes of power.

Warning:
The switched AC outlet should not be used for connection of TVs and other apparatus in which unintended switching could result in fire or other hazard.
This outlet is controlled by the NETZAUSGANG switch ㉝. When the switch is set to AUS, this outlet supplies (220 V∿, 50/60 Hz) regardless of the BETRIEB button setting as long as the power cord of the recorder is plugged in.
When the NETZAUSGANG switch is set to EIN this outlet supplies power only when the recorder is on.

㊿ AUDIO/VIDEO socket
A 21-pin standardised audio/video input/output socket for AV connection to a TV or a 2nd video recorder. The input from this socket can be recorded in the AUX mode engaged by obtaining "AU" in the channel display.

(51) VPV/VPT connector
Connect the VPT (VPV) adapter for decoding teletext programmes and for teletext timer programming.

(52) Pause in terminal (PAUSE EING.)
When using this recorder as the source player, connect to the PAUSE OUT terminal of a second VCR (if so-equipped) for synchronized preroll operation. This terminal can also be used for editing from a JVC VideoMovie camera/recorder using the Master Edit Control system.

(53) Pause out terminal (PAUSE AUSG.)
Connect to the REMOTE PAUSE terminal of a second VCR (if so-equipped) for synchronized preroll operation.

(54) Aerial input connector (ANTENNEN-EINGANG)
Connect an aerial to this connector.

(55) Attenuator switch (ANT. SIGN.)
Set to SCHWACH to receive broadcasts from distant stations. Set to STARK to receive broadcasts of high field strength.

(56) TEST signal switch
Set to EIN when tuning your TV receiver for the video channel. A test signal in the form of two vertical white bars will be available.

(57) RF converter frequency adjustment screw (K40 – K32)
(See page 49.)

(58) RF output connector (HF-AUSGANG)
Connect to the aerial terminal of a TV receiver through the aerial cable (provided).

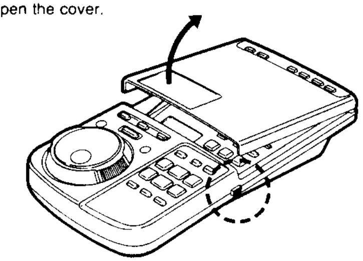
(59) Audio output connectors (AUDIO AUSG.)
Both hi-fi and normal audio signals can be obtained from these connectors. The output can be selected with the AUDIO MONITOR button ㉟ and Hi-Fi/NORM/MIX button ㊱.

(60) Audio input connectors (AUDIO EING.)
Connect an audio tape recorder or other audio sources for recording sound.

(61) Power cord

Remote Control Unit

Grasp the cover where the side tab is located and swing open the cover.



① Operate (TV) button (BETRIEB (TV))
Press to turn the TV power on or off.

② MONITOR (TV/VIDEO) button
Press to select the TV's operating mode.

TV:	For viewing broadcast programmes or tape programmes via HF-AUSGANG connection.
VIDEO:	For viewing programmes via the AV connection.

③ Volume buttons (LAUTSTÄRKE –/+)
Press to decrease or increase the TV's sound volume.

④ Channel buttons (KANAL ∨/∧)
Press to select a desired channel on the TV receiver.

⑤ Multi-purpose numeric keys

Channel selection:	See page 55.
Realtime Go-To and Search functions:	See page 70.
Index Search:	See page 71.

⑥ Counter memory/repeat button (Z.-SPEICHER/WÖCH.)
Functions same as ㉘ as the ZÄHLWERK-SPEICHER button.

⑦ Counter reset button (Z.-RÜCKST)
Press to reset the Realtime Counter reading to "0H 00M 00S".

⑧ Teletext buttons
For teletext operation. (See page 80.)

⑨ CURSOR (⇤/⇥) buttons
Press to specify the direction in the Realtime Search mode. (See page 70.)

⑩ AUDIO MONITOR button
Functions same as ㉟

⑪ On-screen button (BILDSCHIRM KONTROLLE)
- Press to select the language for on-screen messages.
- Press to cancel instantly the on-screen remote programming display.

⑫ VPS/Channel button (VPS/KANAL)
Functions same as ㉖

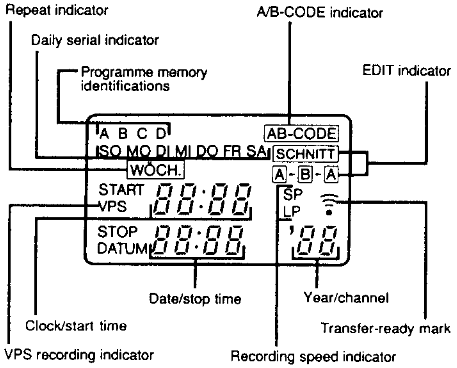
⑬ Mark button (MARKE)
Press during playback or recording to put an index code onto the tape. (See page 71.)

⑭ Erase button (LÖSCHEN)
Press during playback to erase an index code. (See page 71.)

⑮ INDEX button
Press to engage the Index Search mode. (See page 71.)

⑯ Intro button (TITELBILD)
Press to engage the Intro Search mode. (See page 71.)

⑰ LCD (Liquid Crystal Display) panel
Refer to this panel when programming the remote control's built-in timer memory.



⑱ Go-To button (ZIELLAUF)
Press to engage the Realtime Go-To mode. (See page 70.)

⑲ Display button (ANZEIGE)
Press to switch the display among the realtime tape counter, remaining tape time and date.
Also press to change the display from the Timer Set mode to the Clock mode.

⑳ Video cancel button (VIDEO LÖSCHEN)
Press to cancel the programmed data held in the recorder's timer memory in the Timer Set mode.

㉑ Video programme button (VIDEO AUFZ. NR.)
Press to engage the recorder's Timer Set mode.

㉒ A/B-CODE button
When using two JVC video decks, press to switch this remote control from the "A" mode to "B" mode, or vice versa, depending on the deck to be controlled. (See pages 48 and 74.)

㉓ Clock adjust button (UHREINSTELLUNG)
Press to adjust the clock of the remote control.

㉔ Duet editing mode, Stand-by and Start buttons (SCHNITT-BETRIEB, SCHNITT-BEREIT, SCHNITT-START)
Duet Editing controls for simultaneous control of two JVC decks in editing. (See page 74.)

㉕ <</>> (Variable search) buttons
Press either button to search for a specific segment of the programme at variable speeds. (For details, see page 62.)

㉖ II (Pause/Still) button

㉗ ◀◀/▶▶ (Rewind)(Fast-Forward)(Shuttle Search) buttons

㉘ ▶ (Play) button

㉙ Skip/Blank search button (SPRING./BLANK SUCHL.)
- Press while in the Play mode to skip through unwanted tape segments. (See page 60.)
- Press in the Stop mode to engage the Blank Search mode. The tape will automatically stop at the beginning of a non-recorded section. (See page 65.)

㉚ ■ (Stop) button

㉛ ● (Record) button
Press together with the ▶ button ㉘ to start recording.

㉜ Operate (video) button (BETRIEB (VIDEO))
Press to turn the recorder power ON or OFF.
Keep this button pressed for 2 seconds when turning the power off to engage the Child Lock mode. (See page 69.)

㉝ SP/ LP button
Functions same as ㉝

㉞ Eject button (CASSETTE)
Press while in the Stop mode to eject the cassette.

㉟ Memory cancel button (SPEICHER LÖSCHEN)
Press to cancel the programmed data in the remote control's timer memory.

㊱ Timer button (SCHALTUHR)
Functions same as ㉜

㊲ Transfer/Summer time adjust button (ÜBERTRAG/SOMMERZEIT EINST.)
This is a dual-function button.
- as a ÜBERTRAG button — press to transfer the data held in the remote control's timer memory to the recorder.
- as a SOMMERZEIT EINST. button — press to adjust the remote control's clock to the summer time setting. (See page 54.)

㊳ Memory programme button (SPEICHER AUFZ. NR.)
Press to programme the remote control's timer memory.

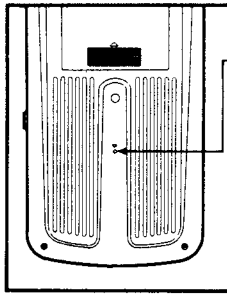
㊴ Channel/Set·Select button and indicator (KANAL/EINSTELLEN·AUSWAHL)
Press this button first when you are going to use the JOG/SHUTTLE controls for purpose other than search. The indicator will light, and will automatically turn off after about one minute if the JOG/SHUTTLE controls are left unused.

㊵ JOG/SHUTTLE button and indicator (JOG SHUTTLE)
Press this button first when you are going to use the JOG/SHUTTLE controls for search. The indicator will light, and will automatically turn off after about one minute if the JOG/SHUTTLE controls are left unused.

㊶ SHUTTLE ring (outer control)
Functions same as VCR's ❿.

㊷ JOG dial (inner control)
Functions same as VCR's ❾.

Remote Control Unit's RESET button



RESET button
Insert a pointed object into the hole to press the initialize button inside, when required. The memory for the LCD display will be cleared. Normally do not touch this button.

Rear of the remote control

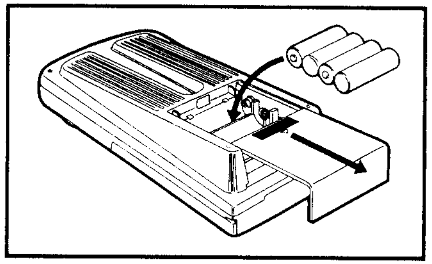
Note:
When the optional VPT (VPV) adapter is connected,four coloured keys and several buttons have additional teletext functions, as indicated by their additional labels.

Remote Control Unit

A/B code switching

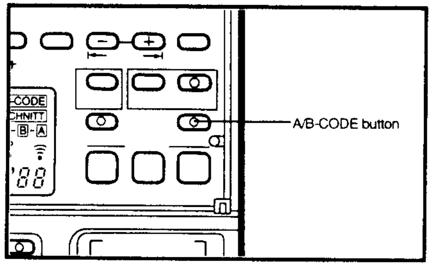
When you own two JVC video decks, this remote control can operate both decks separately; they do not respond simultaneously to the remote control's signal, if they are set to respond to different codes. Initially this recorder is set in the "A" mode.

To change the mode, carefully follow the instructions below:



(1) Unplug the power cord of the recorder from the AC outlet.
(2) Press the A/B-CODE select button to engage the "B" mode; "B CODE" will appear on the LCD.
(3) Plug the power cord of the recorder into the AC outlet.
(4) Turn on the power of the recorder using the remote control's BETRIEB (VIDEO) button ㉜.

The recorder "memorizes" this B code and will respond only to the B code signals. Set the other deck to respond to the A code signals in the same procedure.



Note:

Do not operate other remote controls after you have plugged the recorder into the AC outlet and before you press the BETRIEB (VIDEO) button of this remote control.

CAUTION:

Some televisions may malfunction in response to this remote control when used in the "B" mode. If this should happen, switch the mode back to "A".

Operating distance for remote control unit

- The maximum operating distance is about 8 m.

Installing the batteries

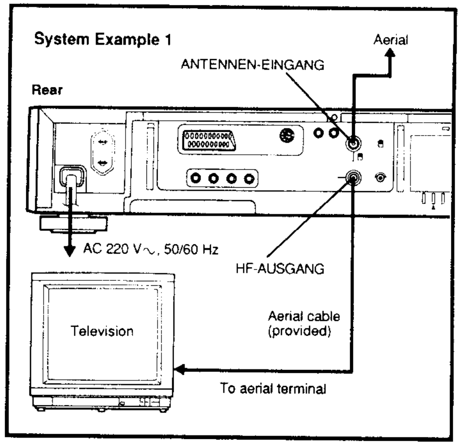
- Insert four "R6"-size batteries (provided) into the battery compartment on the rear of the remote control unit, observing correct polarity.

CAUTION

Do not install a combination of old and new batteries. (Never install a combination of an alkaline battery and a manganese battery.)

CONNECTIONS

System Example 1

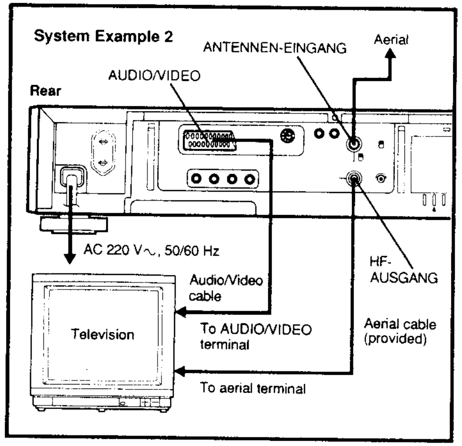


AERIAL AND RF CONNECTION

1. Remove the aerial cable from the television and reconnect it to the recorder's ANTENNEN-EINGANG connector. The recorder is then ready to record off-air programmes.
2. Connect the recorder's HF-AUSGANG connector to the television's aerial terminal using the provided aerial cable. The television is then ready to receive broadcast programmes. When you are not using the recorder, the TV signals are fed to the television via this terminal.

- If your television is equipped with the aerial terminal only, you view tape programmes also via this terminal. In this case, set the television to UHF channel 36 (or a UHF channel adjusted as the video channel). See "VIDEO CHANNEL SETTING" below.
- When a video tape is played back through the HF-AUSGANG connector, the audio is reproduced always as monaural; with hi-fi stereo tapes, both channels are mixed.

System Example 2



AV CONNECTION

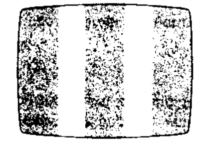
- If your television is equipped with a 21-pin SCART connector, connect the recorder's AUDIO/VIDEO socket to the television's SCART connector.
- To view tape programmes via this connector, set the television to the AV mode.
- If your television is a stereo television, it is possible to play stereo tapes through the television's speakers.

Note:

For switching the television's input mode, refer to the instruction manual of your television.

VIDEO CHANNEL SETTING

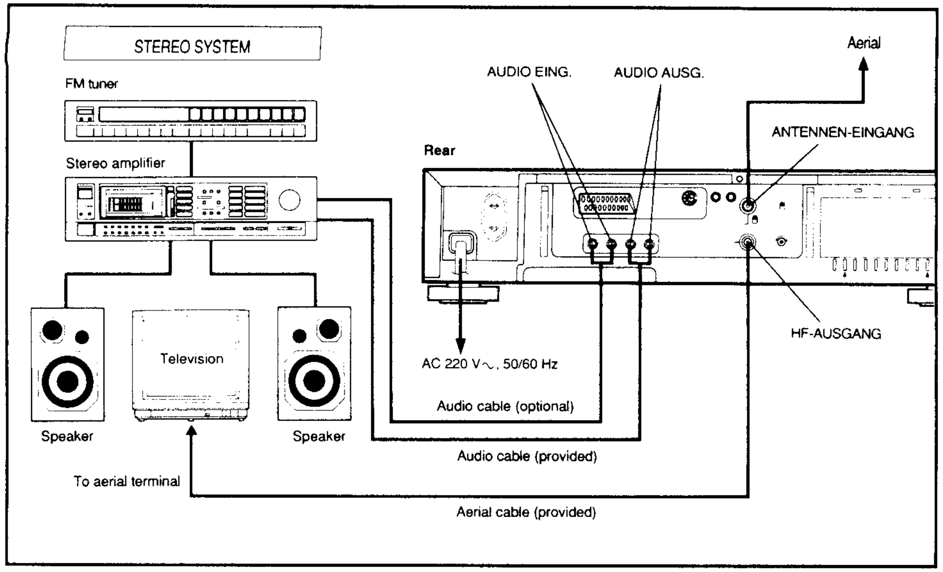
1. Press the BETRIEB button ❶ to turn the power on. Turn on the TV receiver.
2. Set the TEST switch (55) to EIN.
3. Adjust your TV receiver in the vicinity of UHF channel 36 until you bring in the two white signal bars on the screen as illustrated. This is your VIDEO CHANNEL.
4. Reset the TEST switch to AUS.



Notes:

- If some interference noise is seen on the screen because of broadcasts on neighbouring channels or if your preset broadcasts should be affected in picture quality, it is necessary to shift the RF converter output frequency from that of channel 36. Consult your JVC dealer for making this adjustment.
- Video channel setting is also possible using a prerecorded VHS video cassette. Play back the tape and tune the TV receiver to obtain clear pictures and sound while monitoring the playback picture on the TV screen.
- If your TV receiver is not provided with an AFC circuit, perform fine tuning of the TV receiver when you are actually viewing video cassettes.

TO A STEREO SYSTEM



Procedure

1. Connect the AUDIO EING. L and R connectors of the recorder to the recording output terminals of the amplifier. (Exactly as one hooks up an audio cassette deck).
2. Connect the AUDIO AUSG. L and R connectors of the recorder to the AUX IN or TAPE MONITOR terminals of the amplifier.

CAUTION:

- This recorder has a dynamic range of more than 90 dB with regards to its hi-fi audio capability. It is recommended that you check the maximum level if you are going to listen to the hi-fi audio signals through a stereo amplifier. A sudden surge in speaker input may cause speaker damage.
- Some speakers and televisions are specially shielded to prevent television interference. If both are of the non-shielded type, do not place the speakers adjacent to the TV set, otherwise the video playback picture will not be normal because of mutual interference.

Notes:

- Observe L and R when connecting the audio input and output connectors of the recorder to a stereo amplifier.
- If stereo or bilingual TV broadcasts are receivable in your area, this recorder can record them independently of the TV set and play them back through the connected audio system.
- When listening to sound from the connected stereo system, turn down completely the sound volume of the TV receiver.
- Listening to stereophonic sound is also possible using stereo headphones connected to the front panel KOPFHÖRER jack ⓲.
- With this setup, you can enjoy prerecorded Hi-Fi VHS video tapes in hi-fi stereo while viewing them on a regular TV receiver, and also you can record FM simulcast television programmes with hi-fi audio accompaniment. See page 64.
- If you want to timer-control the recording of FM simulcast programmes, connect the tuner's power cord to the recorder's AC outlet. Set the NETZAUSGANG switch ㉝ to EIN, and both the tuner and the recorder will be switched on at a time preprogrammed by the recorder. Timer-controlled recording of FM simulcast programmes is not possible with the type of tuners which reset the channel each time the power is switched off.

INFORMATION ON THE AUDIO SYSTEM

Hi-Fi and normal audio

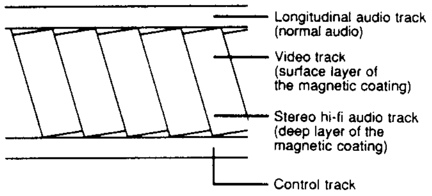
This recorder has two audio systems: Hi-Fi audio and normal audio. Hi-fi audio signals (2-channel) are recorded deep into the tape's magnetic coating of the video track section, while normal audio signals are recorded on the usual longitudinal track.

CAUTION:

- The hi-fi soundtrack recorded with this recorder cannot be reproduced with video equipment other than Hi-Fi VHS.
- The normal soundtrack is compatible with any VHS equipment.

Tape pattern recorded with this recorder

The Hi-Fi and normal soundtracks are recorded simultaneously.


Longitudinal audio track (normal audio)
Video track (surface layer of the magnetic coating)
Stereo hi-fi audio track (deep layer of the magnetic coating)
Control track

Recording options according to the selected input mode

Track / Input mode	Video track	Normal audio track (mono)	Hi-fi audio track (2-channel)
TUNER ▭ (button pressed to OFF)	TV picture (from built-in tuner)	TV sound (from built-in tuner)	TV sound (from built-in tuner)
SIMUL ▭ (button pressed to ON)	TV picture (from built-in tuner)	TV sound (from built-in tuner)	Audio signal from AUDIO EING.
AUX AU Channel display section	Video signal from AUDIO/VIDEO	Audio signal from AUDIO/VIDEO (Mixing with microphone input is possible.)	

Notes:

- To engage the AUX mode, turn the JOG dial (First, press the KANAL/EINSTELLEN·AUSWAHL button when you use the remote control).
- Microphone input will be mixed with the audio signals on the hi-fi audio track only when the AUX mode is selected.
- You can record audio only (without recording any video signal) in either the SP or LP mode. In the LP mode you can enjoy up to 8 hours of hi-fi stereo recording with a single cassette (E-240).

Recording options according to the type of broadcasts and the setting of the 2-KANALTON HAUPT/NEBEN switch

Audio Track / 2-KANALTON HAUPT/NEBEN switch position / Type of broadcast		Normal audio track (mono)	Hi-fi audio track (2-channel)	
			L	R
Regular (monaural audio)	Either position	Mono	Mono	
Stereo broadcast	Either position	L + R mixed	Stereo	
Bilingual broadcast	HAUPT	Main soundtrack (local language)	Main soundtrack (local language)	Sub soundtrack (foreign language)
	NEBEN	Sub soundtrack (foreign language)		

Hi-Fi audio recording level adjustment

While recording onto the normal audio track is controlled by the built-in Automatic Level Control circuit, hi-fi audio recording has two control options: manual and automatic.

Hi-Fi AUFNAHMEAUSSTEUERUNG controls

Slide these controls, the upper for left channel and the lower for right channel, for manual adjustment of the Hi-Fi audio recording level.

AUDIO-BEGRENZER switch

Setting this switch to EIN activates the built-in audio limiter circuit for both channels so that the recording level is automatically controlled. For manual adjustment, set this switch to AUS. (The recording level for normal audio is always controlled automatically regardless of the setting of this switch.)

Audio level indicators

For manual control of the recording level, first set the relevant switch and button as follows:

AUDIO-BEGRENZER ⑳ → AUS
AUDIO MONITOR ㉟→ Hi-Fi L and R (Hi-Fi Stereo)

Then slide the Hi-Fi AUFNAHMEAUSSTEUERUNG controls referring to these indicators. When indicators up to or near 0 dB light for the loudest signal being applied, the recording level is optimum. (The level at which only one red indicator lights from time to time may be most appropriate.)

During playback, these indicators show the level of audio signals recorded on the tape.

Notes:

- With the AUDIO MONITOR and Hi-Fi/NORM/MIX buttons pressed so either Hi-Fi L or R or NORM indicator lights on the FDP, the recording level of hi-fi audio signals cannot be correctly indicated. Select both Hi-Fi L and R indicators when adjusting the recording level.
- The normal audio signal level is also displayed by these indicators, but cannot be adjusted.

Dual-audio playback flexibility

HI-FI/NORM/MIX button

Operates in conjunction with the AUDIO MONITOR button to select soundtracks for listening.

- When the power is turned on, both hi-fi channels can be listened to. Press this button once to listen to only the normal soundtrack (the NORM indicator lights).
- Press this button again to listen to a mixture of hi-fi stereo (Hi-Fi L and/or Hi-Fi R), and normal soundtracks, by selecting the combination with the AUDIO MONITOR button.

Notes:

- This button functions during recording as well, although it has no effect on the recorded signal.
- When playing back a tape containing the same soundtrack on both hi-fi and normal audio tracks, a slight time lag is sensed between the two soundtracks, probably with some distortion when listening in the Mix mode.

AUDIO MONITOR button

Selects the hi-fi audio channel (left, right or both) for listening. Use this button together with the Hi-Fi/NORM/MIX button referring to the four indicators (Hi-Fi, L, R and NORM).

- When the power is turned on, the Hi-Fi L and R indicators light and both hi-fi channels can be listened to. Press this button and only the Hi-Fi L indicator lights to listen to only the left hi-fi channel sound.
- Press this button again and only the Hi-Fi R indicator lights to listen to only the right hi-fi channel sound.

Notes:

- This button functions during recording as well, although it has no effect on the recorded signal.
- With the Hi-Fi/NORM/MIX button pressed for the NORM setting, pressing the AUDIO MONITOR button has no effect.

PEGELANZEIGE switch and SPURLAGE buttons

The right-channel audio level indicator also functions as a tracking meter during playback. If noise or breaks are sensed in the reproduced sound from the hi-fi audio track or noise bars are visible on the screen, perform manual tracking adjustment using the SPURLAGE buttons (see page 59) while referring to the meter. For this purpose, set this switch to Hi-Fi SPURLAGE and press the buttons so that the greatest number of elements of the right-channel indicator light. When this switch is set to AUS, the indicators do not light, regardless of whether during recording or playback.

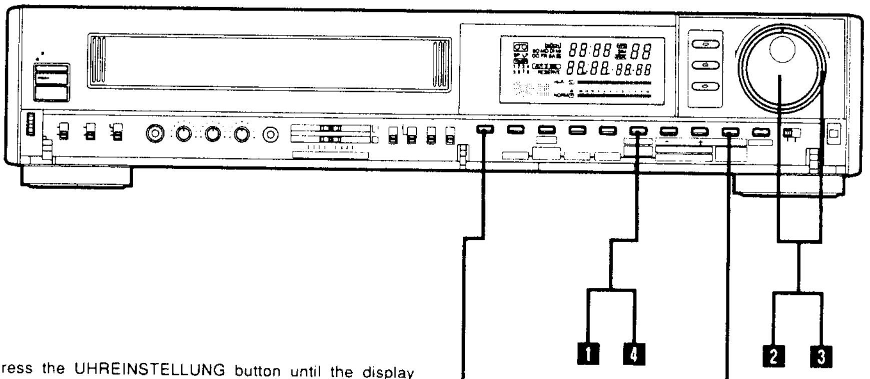
Note:

When playing back a tape with no recording on the hi-fi audio track, the level indicator does not light when the PEGELANZEIGE switch is set to Hi-Fi SPURLAGE.

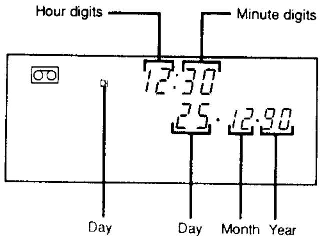
CLOCK SETTING

Setting the built-in clock

Plug the recorder into an AC outlet. The display shows a blinking 0:00.



1. Press the UHREINSTELLUNG button until the display shows the Clock Set mode with the hour indication blinking.
2. Turn the JOG dial to set the current hour, then turn the SHUTTLE ring clockwise.
   - The blinking position is ready for entry.
3. Set the minute, day, month and year in the same way.
   - In year setting, set only the last two digits of the year.
4. Turn JOG or press UHREINSTELLUNG.
   - Press it at the exact instant of the time signal, and the clock will be set accurately to the present time.
   - The day-of-the-week indication will be displayed automatically.



Notes:

- Clock setting is not possible in the timer recording standby mode. First check to see that the TIMER indicator on the FDP is not lit.
- Enter the data within 10 seconds after pressing the UHREINSTELLUNG button.

SUMMER TIME ADJUST

This convenient feature is for quickly making the annual clock adjustment to the "summer time" (daylight saving time) setting, and back to regular time later.

1. Simply press and quickly release the SOMMERZEIT EINST. button in the Clock Set mode to set the clock forward by one hour.
2. Later in the year, to switch back to regular time, simply hold the SOMMERZEIT EINST. button pressed for 2 seconds to set the clock back by an hour.

DISPLAY OFF

Press the ANZEIGE AUS button to make all indications on the FDP disappear when they are not required; the display will show "– : –". Press again to make the clock display reappear.

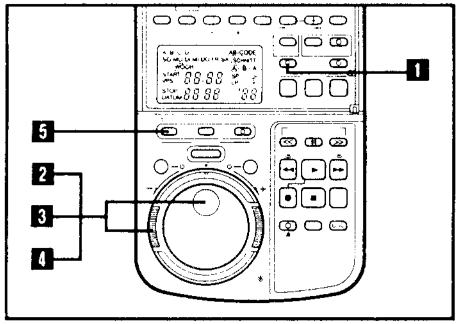
Power failure indicator

The blinking 0:00 (initial condition of the display) is also a power failure indicator, showing that there has been a power failure exceeding about 3 minutes. Readjusting the time restores the normal condition of the clock display.

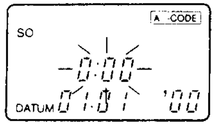
Setting the LCD clock of the remote control unit

The LCD clock is independent of the recorder's clock.

The recorder's clock can be adjusted from the remote control unit if its transfer function is used.

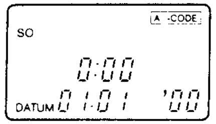


Insert four "R6"-size batteries (provided) into the remote control. The LCD shows the following with "0:00" blinking.



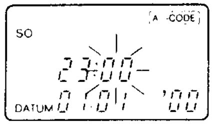
1 Press the UHREINSTELLUNG button.

- The hour indication will blink.



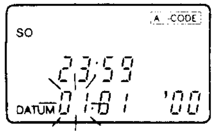
2 Turn the JOG dial to set the current hour, then turn the SHUTTLE ring clockwise.

- The minute indication will blink.



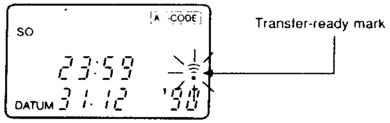
3 Turn the JOG dial to set the current minute, then turn the SHUTTLE ring clockwise.

- The day indication will blink.



4 Set the day, month and year in succession in the same way.

- In year setting, set only the the last two digits of the year.
- After setting the year and turning the SHUTTLE ring clockwise, the transfer-ready mark will appear and blink.



5 Press the ÜBERTRAG button at the exact instant of the time signal.

- The day-of-the-week indication will be displayed automatically.
- The clock of the remote control will be set accurately to the second and, at the same time the set data will be transferred to the clock of the recorder.
- When it is not necessary to transfer the clock data to the recorder, press the UHREINSTELLUNG button instead of the ÜBERTRAG button to set the remote control's clock.
- If the transfer-ready mark disappears before transmission, press the UHREINSTELLUNG button to make it reappear, then press the ÜBERTRAG button while the transfer-ready mark is blinking; otherwise, the ÜBERTRAG button will function as a summer time adjust button.
- If the clock has already been set, the transfer-ready mark starts blinking when the UHREINSTELLUNG button is pressed.
- To transfer the data to the recorder's clock, simply press the ÜBERTRAG button.
- To readjust the clock, press the UHREINSTELLUNG button and then turn the SHUTTLE ring either direction so that the position which requires correction blinks.

SUMMER TIME ADJUST

For quickly making the annual clock adjustment to the "summer time" (daylight saving time) setting, and back to regular time later, use the SOMMERZEIT EINST. button ㊲.

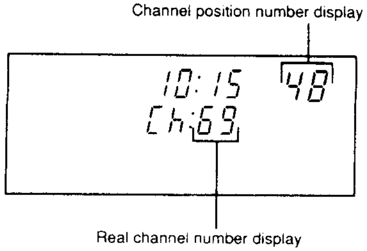
1. Simply press and quickly release the SOMMERZEIT EINST. button in the Clock mode to set the clock forward by one hour.
2. Later in the year, to switch back to regular time, simply hold the SOMMERZEIT EINST. button pressed for more than 2 seconds to set the clock back by an hour.

Note:

- For summer time adjustment, make sure that the transfer-ready mark is not on the LCD.

OPERATING THE BUILT-IN TUNER

This recorder incorporates an advanced frequency synthesized tuner which is pretuned to 91 channels to cover VHF, UHF and CATV broadcasts. Channel indication is given in two different ways: real channel numbers and channel position numbers. Real channel number indication is available by pressing the VPS/KANAL-EINSTELLUNG button ㉖or ⑫, or during search by pressing the SUCHLAUF button ㉕, while channel position number indication is always available in the channel display.



Correspondence between 91 pretuned TV stations and the recorder's real channel indications

DISPLAY	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20
VHF	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11 (H1)	E12 (H2)	A	B	C	D	E	F	G	H
DISPLAY	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
UHF	E21	E22	E23	E24	E25	E26	E27	E28	E29	E30	E31	E32	E33	E34	E35	E36	E37	E38	E39
DISPLAY	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58
UHF	E40	E41	E42	E43	E44	E45	E46	E47	E48	E49	E50	E51	E52	E53	E54	E55	E56	E57	E58
DISPLAY	59	60	61	62	63	64	65	66	67	68	69								
UHF	E59	E60	E61	E62	E63	E64	E65	E66	E67	E68	E69								
DISPLAY	75	76	77	78	79		81	82	83	84	85	86	87	88	89	90	91	92	93
CATV	X	Y	Z	—	—		S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13
DISPLAY	94	95	96	97	98	99	00												
CATV	S14	S15	S16	S17	S18	S19	S20												

Stored channels

A total of 91 channels are receivable. Of them, up to 48 can be stored for easy channel selection. Prior to shipment, some channels are stored.

It is possible to store more channels or skip some channels if there are no broadcasts on those channels in your area. It is possible to change the stored channels to correspond to your preferred channel allocation. Skipped channels can be restored whenever necessary.

- Channel memories are permanent; the programmed channel allocation will not be erased even if the recorder is unplugged from the AC outlet.

Channel selection

To select a channel for recording, normally use the JOG dial ❾ ㊷ (First, press the KANAL/EINSTELLEN·AUSWAHL button when you use the remote control) or 10 numeric keys ⑤. You can choose any channel from among the stored ones by calling up the corresponding channel position number.

- Turn the JOG dial counterclockwise to scan to a channel in the direction of decreasing numbers; clockwise in the direction of increasing numbers.
- An invalid number larger than 48 will be rejected.

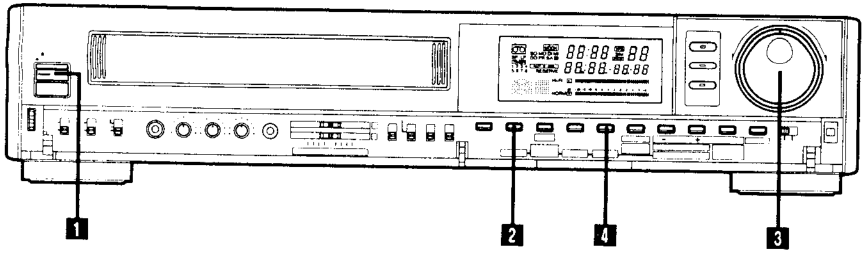
If you want to select a channel other than those stored, engage the Real Channel mode and call up a channel, while referring to the real channel number display.

With recorder's controls:

- Simply press the SUCHLAUF button ㉕

With remote control:

- Press the VPS/KANAL button ⑫ to engage the Real Channel mode and call up a channel by using the 10 numeric keys. For details, refer to the next page.



Storing channels

TV receiver

Turn the TV receiver to ON.

- Adjust it to your video channel or to the AV mode (depending on the connection).

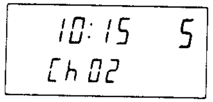
A. Automatic Setting

1 Turn the power on.

- The display will change from the Date mode to the Counter mode.

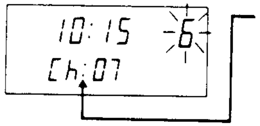
2 Press the SUCHLAUF button.

- The display will change to the Real Channel mode and automatic scanning will take place for "Ch" channels, then for "CC" channels.
- Reverse search will be engaged if the SUCHLAUF button is kept depressed.



VHF channel 2 is stored for channel position 5.

- When a broadcast is detected, scanning stops automatically and the displayed channel position number will blink.



"Colon" will appear to indicate that this real channel is not stored for the indicated channel position.

3 Select a channel position into which you wish to store that station by using the EINSTELLEN buttons ㉚ while the channel position number is blinking.

4 After confirming the real channel number and channel position number, press the SPEICHERN button.

- The Channel position number stops blinking.
- "Colon" will disappear and the selected station has been stored.

B. Manual Setting from remote control unit

(1) Press the VPS/KANAL button ⑫.
- The display will change to the Real Channel mode.

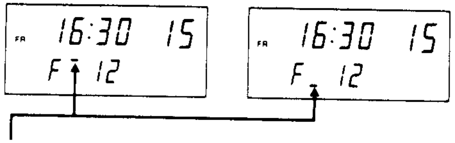
(2) Press VPS/KANAL until the real channel number starts blinking.
- Pressing the VPS/KANAL button will alternate the Real Channel mode between Ch and CC.
- Blinking will stop in 10 seconds.

(3) Enter the number of a real channel to be preset.
- The channel position number will start blinking.

(4) Select a channel position into which the selected real channel is to be stored, using the 10-digit keypad.
- Depress the numeric key for the second digit continuously until blinking stops. This enables the entered number to be stored.
- The display will return to the clock mode by simply keying in the channel number to be viewed.

• Fine Tuning

For fine tuning, press the AUSWAHL button ㉛ in step 3 (both in automatic and manual setting) and use the FEIN "+" or "–" button ㉚; "+" to fine-tune in the direction of increasing frequencies, and "–" to fine-tune in the direction of decreasing frequencies.


FR
16:30 15
F 12
FR
16:30 15
F 12

Upper or lower "-" sign indicates the operating tuning frequency is above or below the standard broadcast frequency.
Center "-" sign will appear when it corresponds to the standard.

Skipping the stored channels

1. Call up the channel position number that you wish to skip by using the JOG dial ❾ or 10 numeric keys.
2. Press the VPS/KANAL-EINSTELLUNG button ㉖.
3. Press the SPRINGEN button ㉗
   - "Colon" will appear to indicate that the displayed real channel is not stored.
   - The skipped channel number will not appear on the channel display during up/down scan tuning.
   - To restore the skipped channel, press the SPEICHERN button after step 3.

Note:

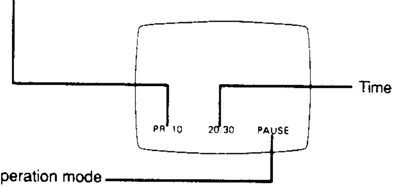
If no command is given after each step of the setting operation, the Real Channel mode will be automatically cancelled in 10 seconds.

ON-SCREEN MODE DISPLAY

Four-language on-screen display is available for timer programming (see page 67) and mode check. To select the language, press the remote control's BILDSCHIRM KONTROLLE button for longer than 2 seconds while a mode check display is on the screen. The screen will display "DEUTSCH", "FRANCAIS", "ITALIANO", and "ENGLISH" in that order where the operation mode is otherwise displayed. Simply release the BILDSCHIRM KONTROLLE button at the language you want.

Channel number or AUX mode

German	French	Italian	English
PR. AU	CH. AU	PR. AU	PR. AU


PR 10
20:30
PAUSE
Time

Operation mode

	German	French	Italian	English
• Play mode	LAUF	LECT	RIPRO	PLAY
• Record mode	AUFN	ENR	REG	REC
• Fast forward mode	VL	AV	AVANZ	FF
• Rewind mode	RL	RET	RIAVV	REW
• Pause mode	PAUSE	PAUSE	PAUSA	PAUSE

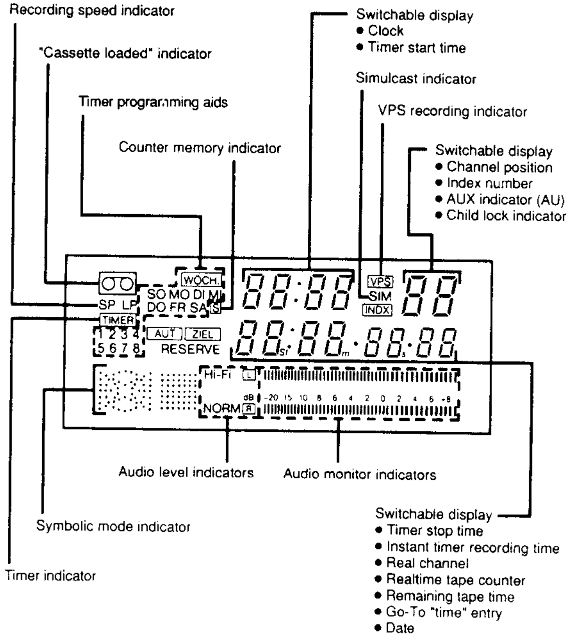
Automatic indication

- Channel number is displayed each time a different channel (or AUX mode) is selected.
- Time is displayed whenever the channel or operation mode is displayed.
- Mode is displayed for 5 seconds each time the operation mode is changed to Record, Play, Fast Forward or Rewind from any other mode. The PAUSE indication remains on for as long as the Record-Pause mode is engaged.

Manual recall

- For checking of the channel, time, or mode, press the BILDSCHIRM KONTROLLE button. The corresponding indication will be available on the screen for 5 seconds.

DISPLAY PANEL INDICATIONS


Recording speed indicator
"Cassette loaded" indicator
Timer programming aids
Counter memory indicator
Switchable display
• Clock
• Timer start time
Simulcast indicator
VPS recording indicator
Switchable display
• Channel position
• Index number
• AUX indicator (AU)
• Child lock indicator
WOCH.
SO MO DI MI
DO FR SA S
SP LP
TIMER
1 2 3 4
5 6 7 8
AUT ZIEL
RESERVE
VPS
SIM
INDX
Hi-Fi L
NORM R
dB -20 15 10 8 6 4 2 0 2 4 6 +8
Audio level indicators
Audio monitor indicators
Symbolic mode indicator
Timer indicator
Switchable display
• Timer stop time
• Instant timer recording time
• Real channel
• Realtime tape counter
• Remaining tape time
• Go-To "time" entry
• Date

Symbolic mode indicators

PLAY:	▷
FF:	⏩
REW:	⏪
FF VARIABLE SHUTTLE SEARCH:	▷ ⏩
REW VARIABLE SHUTTLE SEARCH:	◁ ⏪
STILL: FORWARD SLOW:	▷ ⏸
STILL: REVERSE SLOW:	◁ ⏸
RECORD:	○
RECORD PAUSE:	○ ⏸
AUDIO DUBBING:	◌
INSERT	⊳

LOADING AND UNLOADING A CASSETTE

Motorized Loading System

- The cassette can be loaded even when the power has not been turned on. Inserting a cassette into the loading slot turns the power on automatically.
- The cassette can be unloaded even when the power has been turned off. If a cassette is inside, pressing the CASSETTE button turns the power on automatically and, after ejection of the cassette, shuts it off automatically.

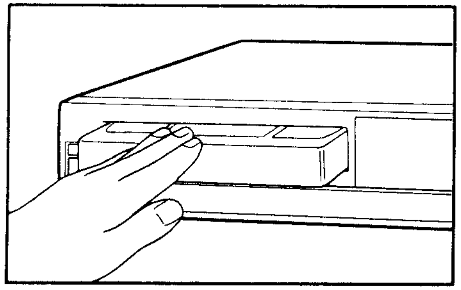
Auto-Play System

- Inserting a cassette, with its safety tab removed, turns the recorder on and playback of the cassette begins automatically.

LOADING

Insert a cassette as illustrated with its labelled side facing you.

- With a cassette inserted, the "▭" indicator appears on the FDP.
- The counter resets automatically when a cassette is inserted.



Notes:

- Be sure to insert the cassette firmly into the slot; otherwise it will be automatically ejected.
- The automatic loading mechanism will operate only when the cassette is inserted correctly.

UNLOADING

Press the STOP/CASSETTE button ❷ in the Stop mode.

Caution

- If unloading of a cassette is not possible, check to see whether the TIMER indicator is lit. If so, press the SCHALTUHR button so the TIMER indicator extinguishes.
- Do not attempt to pull out the cassette once automatic loading has started.

WARNING

- Do not insert fingers or any foreign object beyond the door flap of the cassette loading slot, as this could lead to injury or damage to the mechanism. Show special caution with children.

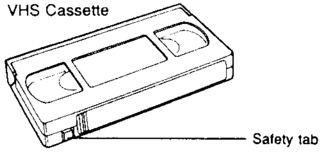
USABLE CASSETTES AND THEIR RECORDING TIME

Both regular VHS and S-VHS cassettes can be used with this video recorder for recording. However, only regular VHS recordings can be made and played back on this video recorder. S-VHS recordings can neither be made nor played back on this video recorder.

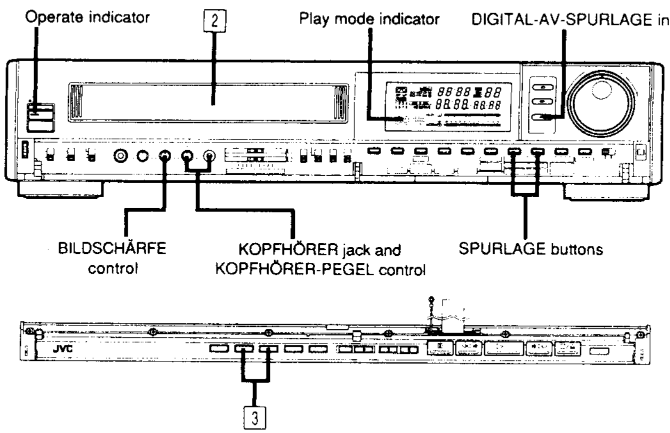
Type of Cassette	Recording/Playback Time	
	SP (Standard Play)	LP (Long Play)
E-30	30 minutes	1 hour
E-60	1 hour	2 hours
E-90	1 hour, 30 minutes	3 hours
E-120	2 hours	4 hours
E-180	3 hours	6 hours
E-240	4 hours	8 hours

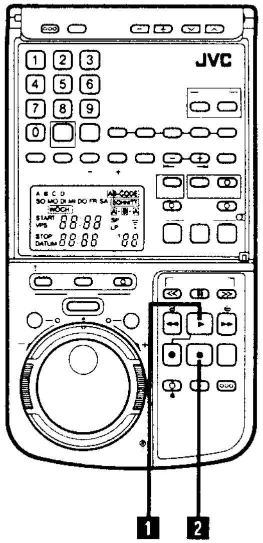
ACCIDENTAL ERASURE PREVENTION

- Video cassettes are equipped with a safety tab to prevent accidental erasure. When the tab is removed, recording cannot be performed. If you wish to record on a cassette whose tab has already been removed, use adhesive tape to block the hole.



PLAYING BACK A VIDEO CASSETTE





PREPARATION

1. Switch on the TV receiver.
   - Set the TV receiver to your video channel or to the AV mode (depending on the connection).
2. Load a pre-recorded cassette.
   - Power will be switched on automatically.
   - When a cassette with its safety tab removed is loaded, playback starts automatically.
3. Make the AUDIO MONITOR ㉟ and Hi-Fi/NORM/MIX ㊱ setting as required. (See page 52.)

DIGITAL AV TRACKING SYSTEM

This recorder incorporates a digital AV tracking system for automatic tracking adjustment. In most cases you do not have to adjust the tracking.

- When you start playback after inserting a tape, the digital tracking system automatically adjusts the tape path relative to the heads to obtain the best possible pictures and Hi-Fi stereo sound.
- If there is no recorded Hi-Fi audio, tracking is set referring to the video signal. The audio output is automatically switched to normal audio.
- This automatic tracking adjustment also takes place when the playback output level reduces below a certain level.
- The DIGITAL-AV-SPURLAGE indicator blinks while the system is searching for optimum tracking, and remains lit as long as the automatic tracking mode continues.

If automatic tracking fails, and some noise bars are visible on the screen, use the manual tracking mode.

- Press both SPURLAGE (+/–) buttons simultaneously to cancel the automatic mode, then press either button to move noise bars out of the screen.
- To return to the automatic mode, press both buttons simultaneously.

OPERATING PROCEDURE

1 Press the ► button.

2 Press the ■ button at the end of the programme.

Notes:

- For various convenience facilities and special-effects features available during playback, see the next two pages.
- The tape-end auto-rewind mechanism functions in the Play, Fast Forward and Forward Search modes.
- When listening through headphones, if the volume is too low or too high, adjust the KOPFHÖRER-PEGEL control for comfortable listening.

PICTURE SHARPNESS ADJUSTMENT

Images on the screen can be adjusted to a preferred softer on sharper definition by turning the BILDSCHÄRFE control in the corresponding direction.

SKIP SEARCH

During playback, press the SPRING./BLANK SUCHL. button from 1 to 4 times to skip through 30-sec. to 2-min. sections of tape. Playback resumes automatically. Press the ► button to cancel the Skip Search mode midway.

MEMORY PLAY

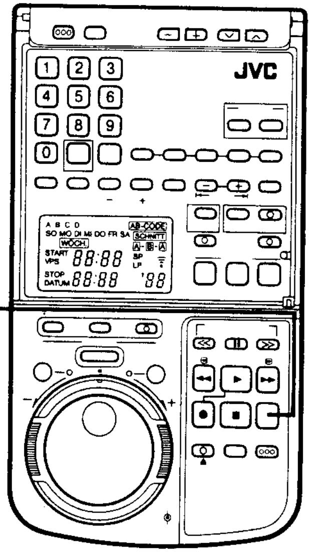
If you want to watch the tape from its beginning after rewinding, you do not have to wait for completion of rewind to press the ► button.

- Press the ◄◄ button and then ► button within 2 seconds. Playback will start automatically at the beginning of the tape. (Check to see that the counter memory indicator M is off).
  If you want to watch the tape from the counter reading of "0H 00M 00s", press the Z.-SPEICHER button to obtain M. Then, press the ◄◄ (or ►►) button and then ►.
- While the tape is being rewound, the Play (▷) indicator is blinking. To cancel the Memory Play mode and go to another mode, press the corresponding button (■, ►, ►►, ◄◄).

More Next-Function Memory Features

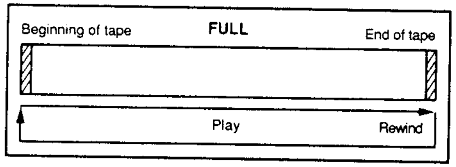
If you are going to eject the cassette, or turn the power off after rewinding the tape, press the CASSETTE or BETRIEB (VIDEO) button within 2 seconds after pressing the ◄◄ button.

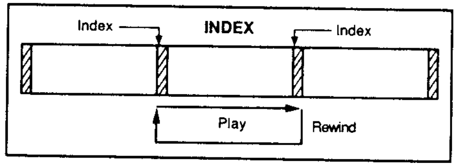
Note:
- For various tape access methods that can be used in different applications, refer to pages 70 and 71.



REPEAT PLAYBACK — FULL REPEAT OR INDEX REPEAT

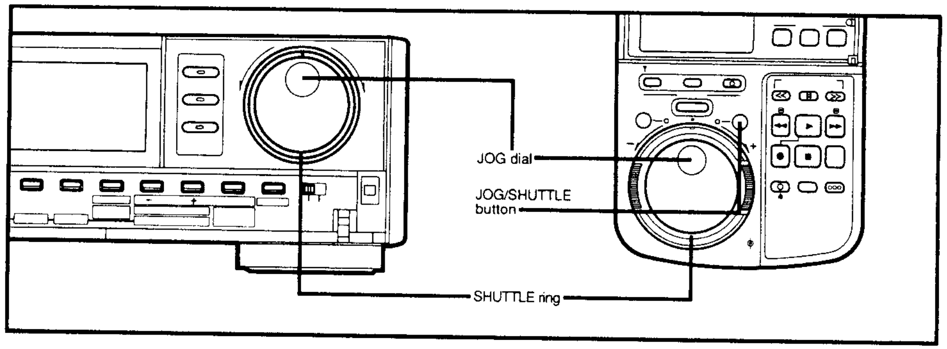
This function allows you to set the video recorder for repeated playback (5 times) of the entire tape ("KOMPL.") or repeated playback (5 times) of a segment of the tape from one index mark to the next ("INDEX").





1. Set the WIEDERHOLUNG switch ⑩ as required.
2. With the switch in the INDEX position, you can designate the segment using the Index Search mode or Index Mark function. (See page 71).

Note:
After repeat playback, be sure to reset the WIEDERHOLUNG switch to "AUS".

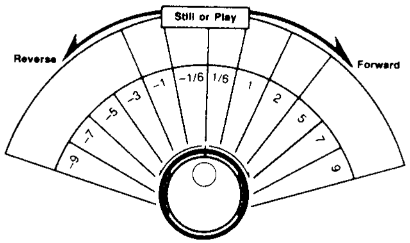


VARIABLE-SPEED SEARCH

SHUTTLE ring (When using the remote control's SHUTTLE ring, press the JOG/SHUTTLE button first so that its LED indicator lights.)

By turning the SHUTTLE ring clockwise or counterclockwise, variable-speed search is possible in either the forward or reverse direction from either the Play or Still mode.

- To search in the forward direction, turn the SHUTTLE ring gradually clockwise. The farther the dial is rotated, the faster the search speed becomes — from 1/6 to 9 times normal in the SP and LP modes.
- To search in the reverse direction, turn the SHUTTLE ring gradually counterclockwise. The farther the dial is rotated, the faster the search speed becomes — from -1/6 to -9 times normal in the SP and LP modes.
- Releasing the SHUTTLE ring produces a still picture on the screen.

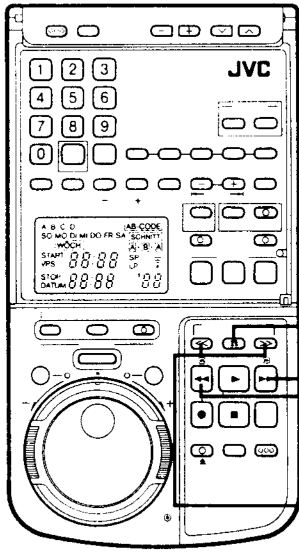


FRAME-BY-FRAME PLAYBACK

JOG dial (When using the remote control's SHUTTLE ring, press the JOG/SHUTTLE button first so that its LED indicator lights.)

- While in the Still mode, the tape can be advanced or moved back a frame at a time for precise location of a specific point in a scene. (This function is especially convenient for locating edit-in and edit-out points during editing.)
- Turn the JOG dial clockwise while in the Still mode to advance the picture; counterclockwise to move the picture back.
- If the JOG dial is rotated at a speed of about one revolution per second, the picture moves at about 1/6 normal speed. If rotated at about two revolutions per second, the picture moves at about normal speed playback.
- Releasing the JOG dial produces a still picture on the screen.

SPECIAL-EFFECTS PLAYBACK WITH OTHER BUTTONS



STILL PLAYBACK AND FRAME ADVANCE

II button

- To view a still picture, press this button in the Play mode.
- To advance the picture frame by frame, press this button again.
- To return to normal playback, press the ► button.
- When the Still mode continues for longer than about 5 minutes, the Stop mode will be entered automatically.

HIGH-SPEED FORWARD SEARCH

►► button

- To fast forward the tape, press this button in the Stop mode.
- To shuttle search the tape in the forward direction, press this button in the Play mode.
- The shuttling speed is about 9 times normal.
- Press the ► button to return to normal playback.
- For briefer scanning, keep the button pressed for more than 2 seconds; when you release the ►► button, the Search mode will be cancelled.

HIGH-SPEED REVERSE SEARCH

◄◄ button

- To rewind the tape, press this button in the Stop mode.
- To shuttle search the tape in the reverse direction, press this button in the Play mode.
- The shuttling speed is about 9 times normal.
- Press the ► button to return to normal playback.
- For briefer scanning, keep the ◄◄ button pressed for more than 2 seconds; when you release the button, the Search mode will be cancelled.

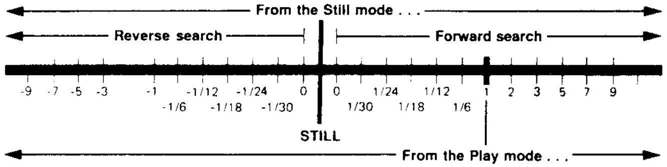
VARIABLE-SPEED SEARCH AND SLOW MOTION

Variable search buttons (≪/≫)

The variable search buttons control both the direction and speed of tape search, making possible fast- and slow-motion playback in either forward or reverse direction from either the Still or Play mode.

Operation tips:

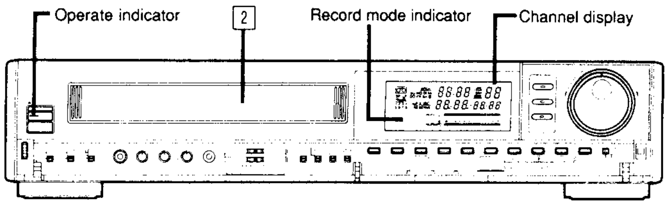
- To increase speed while in the forward direction, press ≫ repeatedly; to decrease, press ≪ repeatedly. The direction reverses after leaving the Still mode.
- To increase speed while in the reverse direction, press ≪ repeatedly; to decrease, press ≫ repeatedly. The direction reverses after leaving the Still mode.
- To return to normal playback, press the Play button.

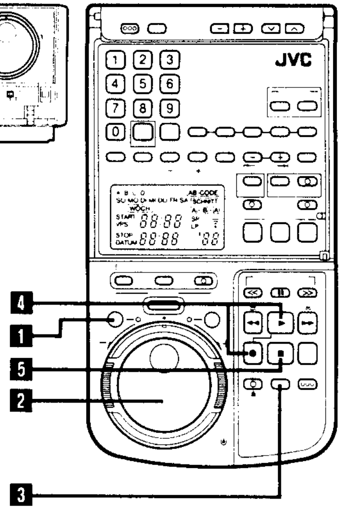


Notes:

- With some televisions, the still picture may be unstable. If vertical vibration of the picture is observed, attempt to correct it by pressing the V-BILDFANG buttons.
- If noise bars are visible in the Special-Effects Playback mode, attempt to correct it in the manual tracking mode as described on page 59.
- No audio is available during any special-effects playback mode.

BASIC OPERATION FOR RECORDING TV PROGRAMMES





PREPARATION

1. Switch on the TV receiver.
   - Set the TV receiver to your video channel , or to the AV mode (depending on the connection).
2. Load a cassette (with safety tab in place). Power will be switched on automatically.

OPERATING PROCEDURE

1. Press the KANAL/EINSTELLEN•AUSWAHL button so that the indicator lights.
2. Select the channel you wish to record with the JOG dial.
3. Select the recording speed (SP or LP)
   SP: 4 hours with an E-240 cassette.
   LP: 8 hours with an E-240 cassette.
4. Press the ● and ► buttons simultaneously to start recording. "INDX" will appear on the FDP and blink to show that an index code is being recorded.
   (When using the video recorder's front panel control buttons, press AUFN./DA once to start recording.)
5. Press the ■ button at the end of the programme.

RECORDING ONE TV PROGRAMME WHILE WATCHING ANOTHER

A programme not being viewed can be recorded while you enjoy viewing another programme.
This permits the recorded programme to be played back later at your convenience.

The key points to remember are:

- Select the channel you wish to record with the recorder's channel selector.
- Select the channel you wish to view with the TV receiver's channel selector.

Notes:

- If the AUFN./DA button is pressed more than once, the Instant Timer Recording mode will be entered (see page 66). To return to ordinary recording, repeatedly press the AUFN./DA button until the AUT indicator on the FDP extinguishes.
- If there is part of the programme you do not want to record, press the II button. To release the Pause mode. Press the ► button.
- When recording is restarted from the Record-Pause mode, assemble recording is performed so that the playback picture will not distort at the edit point. A few frames recorded before the pause may be erased due to overlap of the new recording. This is not due to any defect of the unit.
- When the Record-Pause mode continues for longer than about 5 minutes, the Stop mode will be entered automatically.
- If the ● button cannot be engaged, check to see if the cassette safety tab has been removed. (See page 58).
- When the end of the tape is reached during recording, the tape is automatically rewound to the beginning and stops.
- The built-in tuner's automatic channel lock mechanism prevents the selected channel from being altered during recording. Therefore, if you wish to change the channel during recording, first engage the Record-Pause mode and then select a different channel by using the JOG dial on the remote control unit (first, press the KANAL/EINSTELLEN•AUSWAHL button).

OTHER RECORDING POSSIBILITIES

RECORDING STEREO TV PROGRAMMES

(Applicable only to the West German Sound-Multiplex TV system)

If stereo TV programmes are broadcast in your area, this recorder automatically receives them in stereo. When a stereo programme is being received, the STEREO indicator lights and recording is made in stereo on the hi-fi audio track and in monaural (mixed L and R) on the normal audio track. To listen to the stereo soundtrack during recording, set the AUDIO MONITOR button ㉟ ⑩ for Hi-Fi L and R. If this button is left set either in the Hi-Fi L or R position, you will hear only one channel while recording, though the recording is being made in stereo.

- If the quality of the stereo sound being received is poor, set the AUTO/MONO switch ㉓ to MONO. The STEREO indicator will go off, and the broadcast will be received in monaural with better quality.

RECORDING BILINGUAL TV PROGRAMMES

(Applicable only to the West German Sound-Multiplex TV system)

When a bilingual TV programme is being received, the 2-KANAL indicator lights. There is a switch to select the soundtrack to be recorded on the normal audio track, however, because both soundtracks are recorded always on the hi-fi track for selective listening, you can ignore the switch labelled 2-KANALTON HAUPT/NEBEN in most cases unless you need a special soundtrack on the normal audio track.

- Set the 2-KANALTON HAUPT/NEBEN switch ㉒ to HAUPT to record the main soundtrack (local language); to NEBEN to record the sub soundtrack (foreign language).
- To listen to the selected soundtrack from the hi-fi audio track while recording, press the AUDIO MONITOR button for either Hi-Fi L or R.
- To listen to the soundtrack being recorded on the normal audio track, press the Hi-Fi/NORM/MIX button ㊱ for NORM.

RECORDING FM SIMULCAST TV PROGRAMMES

FM simulcast TV programmes can be recorded using an FM stereo tuner. Connect necessary components. (Connect the FM tuner to the rear panel AUDIO EING. connectors.) Select the TV channel broadcasting the simulcast programme with the recorder's channel select buttons and tune the FM stereo tuner to the station broadcasting the soundtrack for that TV programme.

The only difference from the basic recording procedure on page 63 is an additional step.

- Press the SIMUL button ㊲.
  Then the SIM indicator on the FDP will light. With this setting, the video and audio signals from the built-in tuner will be recorded on the video and normal audio track, and the audio signal from the FM stereo tuner will be recorded on the hi-fi audio track.

Notes:

- After finishing recording, be sure to press the SIMUL button to switch back to the Tuner mode.
- While recording simulcast programmes, it might happen that the hi-fi sound distorts momentarily at switching points between different programmes. This is not due to any defect of the unit.

RECORDING A TV PROGRAMME WHILE RECORDING AN INDEPENDENT AUDIO SOURCE

Using the "simulcast" recording function, you can record independent audio and video programmes, because the TV soundtrack is not lost, but recorded on the normal audio track. While recording a TV programme, record any audio source independently.

- Connect an audio component (such as an FM tuner) to the AUDIO EING. connectors (60).
- Press the SIMUL button. The SIM indicator on the FDP will light.

Notes:

- If you stop recording to avoid unwanted material of the TV programme using the PAUSE/STANDB. button, the audio programme from an external source is also cut.
- If television broadcasting comes to an end during recording, the hi-fi sound being recorded from an external source may distort. It is recommended that you check the timetable of TV broadcasts in advance.
- After finishing recording, be sure to press the SIMUL button to switch back to the Tuner mode, otherwise recording on the hi-fi audio track from the built-in tuner will not be possible.

CONVENIENT FACILITIES RELATED TO RECORDING

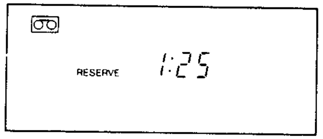
REMAINING TAPE TIME INDICATION

The tape counter can be switched to display the remaining tape time.

- Press the ANZEIGE button to obtain the remain (REVERSE) tape time indication in hours and minutes on the FDP.

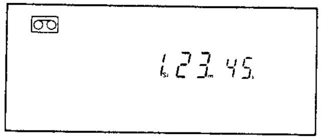
Note:

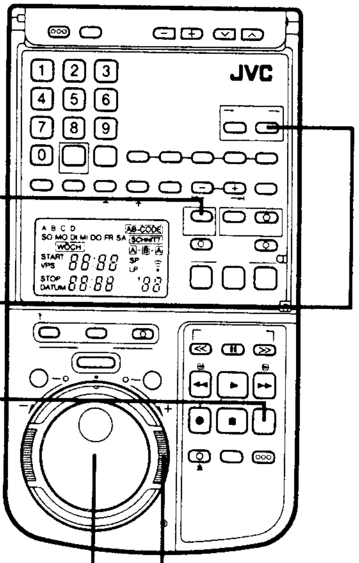
- The indicated remaining time is approximate.



ELAPSED RECORDING TIME INDICATION

When you need to know the exact time of a recording, press the Z.-RÜCKST button before starting recording or playback. The counter will be reset to "0H 00M 00S" and show the exact elapsed time as the tape runs.

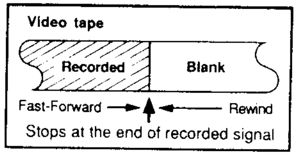




BLANK SEARCH

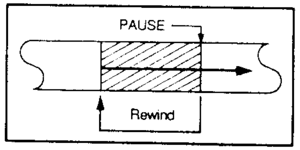
When you want to record a new programme on a partially recorded tape, use this function to automatically locate the end of a recorded section. Even when a fully recorded tape is used for re-recording new material, this system can be used to detect the end of the newly-recorded material.

- Insert a cassette and press the SPRING./BLANK SUCHL. button.
- If a recorded signal is present, the recorder automatically enters the Fast Forward mode, and stops automatically around the end of that recorded section. Before starting recording, play back the tape to determine where to start a new recording.
- If the SPRING./BLANK SUCHL. button is pressed where no signal is recorded, the recorder automatically enters the Rewind mode, searches for the end of the preceding recorded segment, and stops.
- When the SPRING./BLANK SUCHL. button is pressed, the tape counter is automatically switched to the Reverse mode and shows the remaining tape time in hours and minutes. To switch back to the realtime counter mode, press the ANZEIGE button.



RETAKE FUNCTION

While in the Record-Pause mode, turning the JOG dial or SHUTTLE ring (First, press the JOG/SHUTTLE button) initiates search at the corresponding speed in the corresponding direction. Releasing the control engages the Record-Pause mode. If you have recorded unnecessary material because of having engaged the Record-Pause mode too late, use this function to return to the position where you want the next recording to start. Then, simply press the ► button when you want to re-start recording.



INSTANT TIMER RECORDING

24-HOUR TIMER

The 24-Hour Timer Recording feature allows unattended automatic starting and stopping of the recording of a single programme which starts within a 24-hour period.

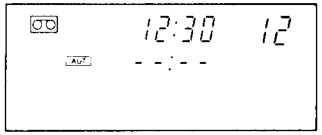
Preparation

1. Insert a cassette with its safety tab in place. The recorder turns on automatically.
2. Select the channel you wish to record from.
3. Select the recording speed (SP or LP).

Setting the timer

1 Press the START button ㊳ to engage the 24-Hour Instant Timer Set mode. The following appears on the FDP with the current time.

FDP



- Each pressing delays the START time by 30 minutes
- For a more precise time setting, use the AUSWAHL and EINSTELLEN buttons.

2 After reaching the desired START time, press the AUFN./DA button the required number of times to set the desired length of recording time

- For a more precise time setting, use the AUSWAHL and EINSTELLEN buttons.

3 After confirming the START time and recording length, press the BETRIEB button.

- "ITR" remains on the FDP and the 24-Hour Instant Timer Standby mode will automatically engaged.
- If the programme has not been correctly preset, the "AUT" indicator will blink for about 10 seconds when the BETRIEB button is pressed. Recheck the programmed data.

Notes:

- At each step of the timer setting procedure, if no data is entered within 10 seconds, the 24-Hour Timer Set mode is cancelled, and the current time is displayed.
- To cancel the 24-Hour Timer Set mode, press the LÖSCHEN button once or twice depending on the setting status.
- 24-Hour Timer Recording has priority over other timer programme settings; therefore, no other programmes, set for timer recording, will be recorded until 24-Hour Timer Recording has been executed.

OFF-TIMER

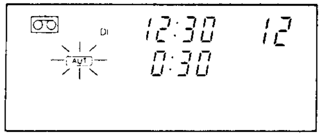
- Start recording as described on page 63.

After you start recording, the recorder can be set to stop automatically after a certain period of time. Use this facility for starting a recording before you go to bed or leave home.

1 Press the AUFN./DA button while recording (or twice if in the Stop mode).

- The following indication will appear on the FDP, to show that the recorder is recording in the Instant Timer Recording mode and power will switch off after 30 minutes.

FDP



2 Each time the AUFN./DA button is pressed, recording time increases by 30 minutes to a maximum of 4 hours. If the AUFN./DA button is pressed again, the Normal Recording mode will be entered.

- For a more precise time setting, use the AUSWAHL and EINSTELLEN buttons to set to the exact time required (possible up to 8 hours and 59 minutes).

Notes:

- While recording is in progress, the displayed time counts down; when 0:00 is reached, the Record mode is released after 10 seconds and the power is switched off.
- If you want to stop recording after having started recording in the Instant Timer Record mode, press the STOP/CASSETTE button.
- If instant timer recording is engaged while the unit is in the Pause mode, the timer will count down normally, but recording will not begin until the WIEDERG. button is pressed.
- When the Instant Timer Record-Pause mode continues for longer than 5 minutes, the mode is released and power is switched off.
- If you want to check the elapsed time (Realtime Counter reading) on the FDP while performing Instant Timer Recording, press the ANZEIGE button to obtain the desired indication. After about 5 seconds, the indicator will return to the AUT mode and the remaining time indication will reappear automatically.

AUTOMATIC TIMER RECORDING

First of all, load a cassette (with safety tab in place); power will be switched on automatically.

Three ways to perform timer programming

A. **Local programming:** Programme the timer using the recorder's controls while referring to the recorder's FDP.

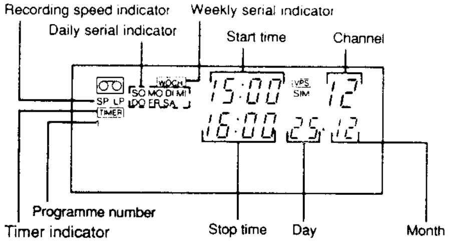
B. **On-screen remote programming:** Programme the timer using the remote control's keys and JOG/SHUTTLE controls while referring to the on-screen display. Before using the remote control's JOG/SHUTTLE controls for this purpose, press the KANAL/EINSTELLEN·AUSWAHL button ㊴ first so that its LED indicator lights.

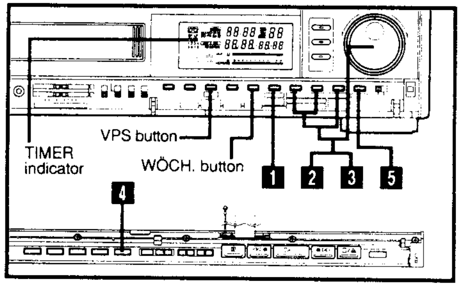
C. **Independent remote programming:** Programming the remote control's memory using the remote control's keys and JOG/SHUTTLE controls while referring to its own LCD and then transfer the data to the recorder anytime at your convenience.

A. Local Programming

1 Press the AUFZ. NR. button.

- The display will change to the Timer Set mode for programme number "1". To advance to programme numbers 2 – 8, press either EINSTELLEN button a required number of times.
- By pressing the remote control's BILDSCHIRM KONTROLLE button while the FDP is in the Timer Set mode, the on-screen display is also available.





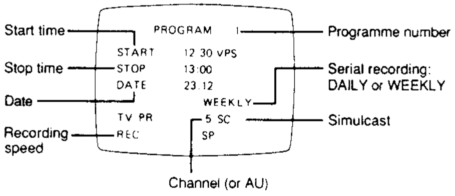
2 [2] Set the start time by using the SHUTTLE ring or the AUSWAHL button and the JOG dial or the EINSTELLEN buttons.

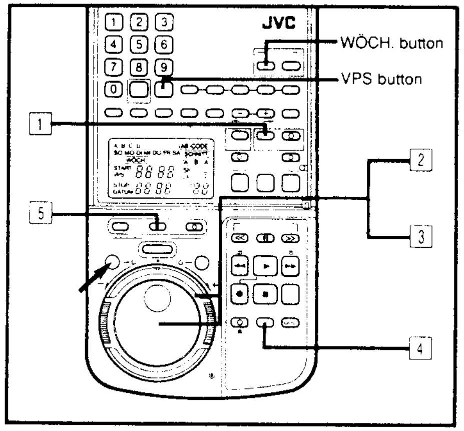
- Select the item to be set with the SHUTTLE ring or the AUSWAHL button; the selected item will blink.
- Set the desired data with the JOG dial or the EINSTELLEN -/+ buttons.
- To record a weekly serial, press the WÖCH.button once.
- To record a daily serial starting on a certain day,WÖCH. twice.

B. On-Screen Remote Programming

[1] Press the VIDEO AUFZ. button.

- The TV screen will change to the Timer Set mode for programme number "1" in one of the selected languages. (For language selection, see page 8.) To advance to programme numbers 2 – 8, first press the KANAL/EINSTELLEN·AUSWAHL button and turn the JOG dial.





3 [3] Set the stop time, date and channel in succession in the same way as for setting the start time.

- To record a daily serial starting on the day of setting, there is no need to enter any date figure; simply advance to the next item.
- When not using the VPS recording system, before setting the channel, press the VPS button to make "VPS" disappear.
- For programming the timer to record an external source, while the channel position is blinking, turn the JOG dial or press EINSTELLEN –/+ until the "AU" indicator appears in the channel display section.

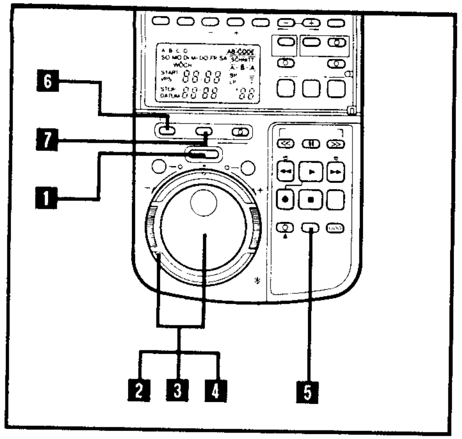
4 [4] Select the recording speed (SP or LP).
SP: 4 hours with an E-240 cassette.
LP: 8 hours with an E-240 cassette.

5 [5] After making sure that the cassette is loaded, press the SCHALTUHR button.

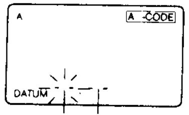
- The Timer Recording Standby mode will be engaged with the TIMER indicator and the preset programme number(s) illuminated and the power turned off.
- With no cassette loaded, the TIMER and "cassette loaded" indicators will continue blinking.
- A cassette whose safety tab has been removed will be ejected automatically.
- If a preset programme contains errors, the programme number will not illuminate. Recheck the programmed data.

C. Independent Remote Programming

- The remote control incorporates 4 programme memories (A, B, C and D).
- The programmed data is held in memory even after it has been transferred to the recorder.



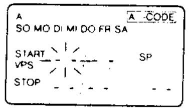
1 Press the SPEICHER AUFZ. button.
- The LCD will be activated for programme memory "A".
- To advance to programmes B to D, turn the JOG dial.



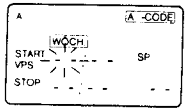
Day Month

2 Turn the SHUTTLE ring clockwise.

3 Enter the date turning the JOG dial, then turn the SHUTTLE ring clockwise.
- Invalid numbers will be rejected.
- To record a daily serial starting on the day of setting, turn the SHUTTLE ring clockwise without entering any date figure.
- To record a weekly serial, press the WÖCH. button once and enter the date.
- To record a daily serial starting on a certain day, press the WÖCH. button twice and enter the date.

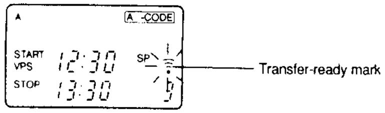


For daily serial setting



For weekly serial setting

4 Enter the start time, stop time and channel in succession.
- After the channel has been entered, the transfer ready mark will appear and blink.
- When not using the VPS recording system, before setting the channel, press the VPS button to make "VPS" disappear.
- For programming the timer to record an external source, Turn the JOG dial counterclockwise while the channel is blinking; "AU" will appear on the LCD. When transferred in step **6**, "AU" will appear in the channel display section on the FDP.



5 Select the recording speed (SP or LP).
SP: 4 hours with an E-240 cassette.
LP: 8 hours with an E-240 cassette.

6 Direct the remote control to the recorder's Remote Sensor window ❺ and press the ÜBERTRAG button.
- The programmed data will be loaded in one of the recorder's memories (1—8), the vacant one of the smallest programme number.
- If all programme memories are full, the recorder's clock will blink and transmission will not take place.
- Call up the programme(s) to be cancelled by pressing the VIDEO AUFZ. NR. button, then press the VIDEO LÖSCHEN button to cancel it. Data transfer can now be made by pressing ÜBERTRAG again.

7 Press the SCHALTUHR button.
- Check to see that the TIMER indicator appears on the FDP.

Setting the date, start and stop times, and channel

- It is not possible to set the date, start and stop times unless the date and clock have previously been set.
- Enter the data while the digits are blinking.
- The stop time can be set within 24 hours of the start time.
- Non-applicable numbers (such as January 32, February 30 for dates, 24 or larger for hours, 60 or larger for minutes and 49 or larger for channels) will be rejected when set to.

Cancelling the preset data

- The preset programmes can be cancelled. First disengage the Timer Standby mode and then engage the Timer Set mode for the programme number you wish to cancel and then press the LÖSCHEN button ㉗ or the VIDEO LÖSCHEN button. Or for the remote control's memory, press the SPEICHER LÖSCHEN button.
- An executed programme is automatically cleared.

Checking the programmed data

- Checking can be performed anytime, even after the SCHALTUHR button has already been engaged. To do this, press the AUFZ. NR. button ㉙while in the Timer Standby mode. The programme number will blink on the FDP and you can check each programme by advancing programme numbers with the JOG dial or EINSTELLEN buttons ㉚. If re-programming is required, disengage the Timer Standby mode and use the regular programming method. Pressing the AUFZ. NR. button and/or EINSTELLEN buttons or turning the JOG dial engages the FDP in the check mode in which no position blinks and data correction is not possible. For correction of data, turn the SHUTTLE ring or press the AUSWAHL button ㉛ and move the cursor to a position which requires correction.

Timer recording operation

- When the preset start time is reached, recording starts.
- After timer recording, the power is switched off. If the end of the tape is reached during timer recording, the cassette is automatically ejected and then the power is switched off.

VPS RECORDING

In the VPS (Video Programme System) system, TV stations transmit different VPS codes for different TV programmes, which control the starting and stopping of the video recorder and have precedence over times preset in the timer for accurate recording of a particular programme from start to finish.

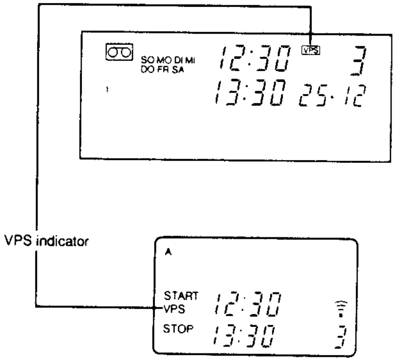
1 Press the AUFZ. NR. button ㉙ (or the VIDEO AUFZ. NR. button ㉑) or, for the remote control's memory, the SPEICHER AUFZ. NR. button ㊳.

2 Set the date, start time, stop time and channel in the same way as for timer programming.

3 Press the VPS/KANAL-EINSTELLUNG button ㉖ or the ⑫.
- All timer data will be converted to VPS codes and stored in memory.

4 Press the SCHALTUHR button ㉜ or ㊱.
- The recorder will enter the VPS Standby mode at 20:00 on the day previous to the preset day and remain engaged until 3:59 on the following day, if the intended programme has not yet been broadcast.
- When a VPS code corresponding to the intended TV programme is detected during the VPS Standby mode, recording will start. When the VPS code changes to another, recording will stop.
- When an interruption code is detected during VPS recording, the VPS standby mode is engaged and recording restarts when the regular VPS code is restored.

Note:
- Operation at the end of VPS recording is the same as with ordinary timer recording.

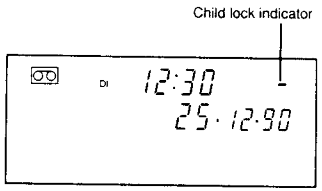


CHILD LOCK FUNCTION

The Child Lock function is for preventing accidental operation by young children, or other unwanted operation, such as playing back or recording over an important cassette you may have left inserted in the recorder. By engaging the Child Lock mode, the operation buttons on the recorder become ineffective, unless the remote control is used.

To engage the Child Lock mode

- Press the remote control's BETRIEB (VIDEO) button ㉜ to turn the recorder power off and keep this button pressed for about 2 seconds after the power LED indicator has gone off.
- The Child Lock indicator (-) will appear in the channel display section on the FDP to show that the recorder is now in the Child Lock mode.



To disengage the Child Lock mode

- When the remote control's BETRIEB (VIDEO) button is pressed to turn the recorder power on, this disengages the Child Lock mode. The recorder will turn on and the corresponding display will appear with the channel number appearing where the child lock indicator appeared before.
- Pressing the SCHALTUHR button during timer recording also disengages the Child Lock mode.

Notes:
- While in the Child Lock mode, the recorder can receive timer programmed data from the remote control.
- Timer recording is possible also, even while in the Child Lock mode. After timer recording has been performed, the Child Lock mode remains in effect.
- Even after automatic cassette ejection at tape end, following timer recording, the Child Lock mode remains in effect.
- It is possible to insert a cassette while in the Child Lock mode. After inserting a cassette, the Child Lock mode remains in effect.

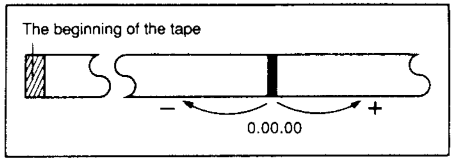
CONVENIENT TAPE ACCESS FUNCTIONS

REALTIME TAPE COUNTER

Unlike usual tape counters which show tape locations in numbers, this realtime tape counter shows tape time precisely in hours, minutes and seconds in all modes. The counter resets automatically when a cassette is inserted.

REALTIME SEARCH

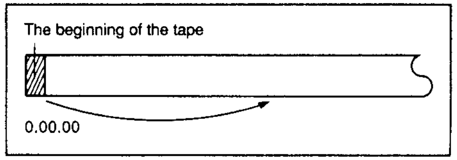
To locate any point on the tape a specified time away from the current position in either direction.



1. Press the remote control's ZIELLAUF button ⑱ while in the Play, Still or Stop mode.
   - The FDP will show "ZIEL –H —M —S" if the recorder did not detect the leader tape when the cassette was loaded; it will show the current tape counter reading if the leader tape has been detected.
   - "ZIEL 0H 02M 34S" (for example) will appear if the recorder has already detected the leader tape, to show the current tape counter reading in terms of realtime from the tape's beginning.
2. Press either CURSOR (⊢—/—⊣) button to specify the direction.
3. Specify the time to the point to be located, by using the numeric keys.
   - Always key in a full number.
4. Press the ▶ or ■ button (❚❚ button, if either the Play or Still mode is already engaged).
   - Depending on the situation, search will take place in either the Shuttle Search mode or in the Fast Forward or Rewind mode. After the specified point is reached, playback starts automatically, the tape stops automatically or enters the Still mode, depending on the command.

REALTIME GO-TO

To locate any point on the tape a specified time away from the beginning of the tape.



The procedure is the same as for the Realtime Search except step 2. Specifying the direction is not necessary.

Notes:
- Each step in the operation procedure must be followed by the next within 60 seconds, otherwise the Go-To or Search mode will be cancelled.
- Use of the other control buttons while in the Go-To or Search mode cancels that mode.
- If the specified time exceeds the tape length, the tape fast forwards to the end and then rewinds to the beginning and stops or enters the Play mode.

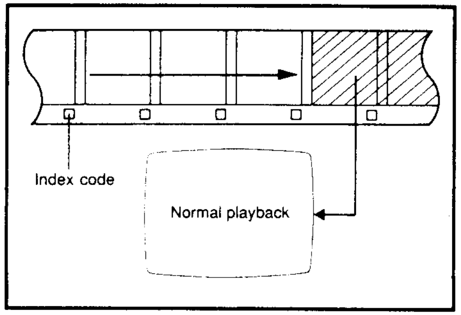
COUNTER MEMORY FUNCTION

1. Press the ZÄHLWERK-RÜCKST button at a point which you may wish to locate later.
   - The counter will read "0H 00M 00S".
2. Press the ZÄHLWERK-SPEICHER button. [S] will appear on the FDP.
3. Press the ◀◀ (or ▶▶) button when you need to return to the designated point.
   - The tape will rewind (or fast forward) and stop at about "0H 00M 00S" automatically.
   - The Counter Memory function can also be used in conjunction with the Memory Play function (page 60).

CONTINUED ON NEXT PAGE . . .

INDEX SEARCH

The Index Search function gives you automatic access to the beginning of individual recordings on the cassette tape. An index code is automatically placed on the tape's control track each time a recording is begun. You can access any one of up to 99 of these indexed segments in either the forward or reverse direction.



1. Press the INDEX button while in the Play or Stop mode.
   - The channel display of the FDP will change to the Index Search mode and "INDX" will light.
2. Specify the index number (1 – 99) using the numeric keys within 10 seconds.
   - The specified number will appear on the FDP.
3. Press either the ◀◀ or ▶▶ button.
   - The tape will move and the index numbers count down to 0, where normal playback will start.
   - If the INDEX button was pressed in the Play mode, the screen shows search pictures; if the button was pressed in the Stop mode, the index codes are detected in the Rewind or Fast-Forward mode.

Notes:
- To cancel the Index Search mode before completion, press the ▶ or ■ button.
- If the end of the tape is reached while still in the Index Search mode, the mode is cancelled and the tape rewound.

MANUAL INDEX MARK/ERASE

Index codes are automatically placed at the beginning of recordings which are started from the Stop or Timer Standby mode. You can use the MARKE button to add extra codes, and the LÖSCHEN button to erase codes. In neither case is there any effect on the audio or video recordings on the tape.

Erase

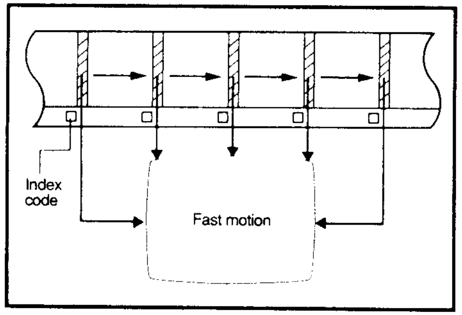
In the Play or Still mode, press LÖSCHEN button to erase the next index code. The tape is automatically fast-forwarded and when an index code is detected, it will be erased automatically. "INDX" on the FDP remains lit during the searching process and blinks during the erasing process.

Mark

In the Play or Record mode, press MARKE button once to put an index code onto the tape. "INDX" appears on the FDP and blinks during the marking process.

Notes:
- Index codes cannot be added or erased on a tape with its safety tab removed.
- The Erase mode is cancelled either after one index code has been erased or the Play mode is cancelled.

INTRO SEARCH

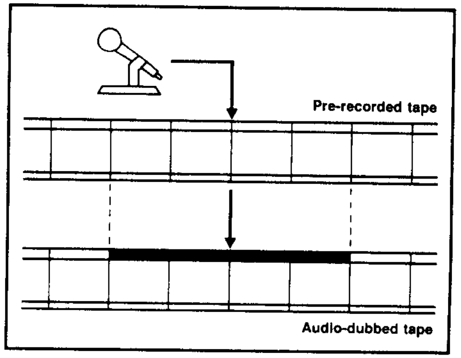


The Intro Search function lets you visually check the contents of each recording by playing back in fast motion a short segment of a programme each time an index code is detected.

1. Press the TITELBILD button while in the Play or Stop mode.
   - The INDX indicator on the FDP will light.
2. Press the ◀◀ or ▶▶ button within 2 seconds.
   - The Intro Search will start in the corresponding direction.
   - Each time an index code is detected, the corresponding part is played back at the search speed (9 times normal) for about 5 seconds.
3. When you find the section you want to view, simply press the ▶ button.
   - Normal playback will start.

AUDIO DUBBING

Audio dubbing means recording a new soundtrack on a pre-recorded tape. In other words, the previously recorded sound is erased and replaced with a new soundtrack.
Audio dubbing is applicable only to the longitudinal audio track (normal audio). Therefore, a dubbed narration can be heard together with the original hi-fi sound.



Operation

1. Switch on the TV receiver.
   - Adjust it to your video channel or to the AV mode (depending on the connection).
2. Load a pre-recorded cassette. Power will be switched on automatically.
3. Connect a microphone to the MIKROFON-EING. jack ⑭
4. Turn the JOG dial (First, press the KANAL/EINSTELLEN·AUSWAHL) to obtain "AU" on the FDP.
5. Be sure that the MIKROFON MIX control ⑮ is set to the appropriate level when required. Connect a pair of headphones to monitor this sound level adjustment.
6. Press WIEDERG. button ㊺ to start playback and then use the JOG/SHUTTLE controls to search for the point from which you wish to start audio dubbing. Release the JOG dial or the SHUTTLE ring at the start point of audio dubbing.
7. Press VERTONUNG button ㊶.
8. Press WIEDERG.
   - Audio dubbing will start.

Notes:

- If whistling or howling is heard during audio dubbing, reduce the TV volume or move the microphone farther away from the TV. Recording is being performed even if sound is not heard from the TV receiver. If you want to monitor the sound being recorded, connect headphones to the KOPFHÖRER jack.
- Marking index codes is not possible while audio dubbing is being performed.

CAUTION:

- Audio dubbing is not possible with an audio source connected to the rear panel AUDIO EING. connectors.

RECORDING FROM AN EXTERNAL SOURCE

By connecting an external video source (such as a 2nd video recorder, VideoMovie camera-recorder, etc.) to the AUDIO/VIDEO socket, tape-to-tape transfer is possible.

- For connection of these units an appropriate cable is necessary.

Connection

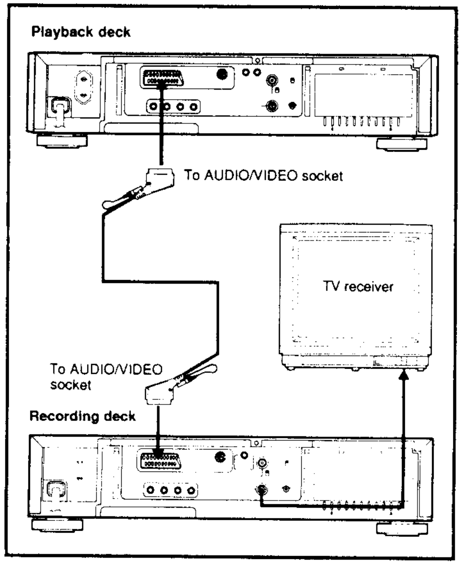
1. Connect the AUDIO/VIDEO socket to the appropriate audio/video output of the 2nd video recorder.
2. Connect a TV receiver to the recorder to monitor the picture while recording.

Operation

1. Turn the power on for all connected equipment.
2. Tune the TV receiver to your video channel.
3. Load a cassette with its safety tab in place.
4. Turn the JOG dial (First, press KANAL/EIN-STELLEN·AUSWAHL using the remote control unit) to obtain "AU" in the channel display section on the FDP.
5. Select the recording speed (SP or LP)
   SP: 4 hours with an E-240 cassette.
   LP: 8 hours with an E-240 cassette.
6. Press the AUFN./DA button ㊵and the PAUSE/STANDB. button ㊸to put the recorder in the Record-Pause mode.
7. Play back a tape on the source equipment to determine the segment to be recorded.
8. Press the WIEDERG. button ㊺to start recording.
9. To stop recording temporarily, press the PAUSE/STANDB. button.
10. To end recording, press the STOP/CASSETTE button ② or ㊼.

Note:

- For the operation of the source equipment, refer to the instruction manual of the relevant machine.



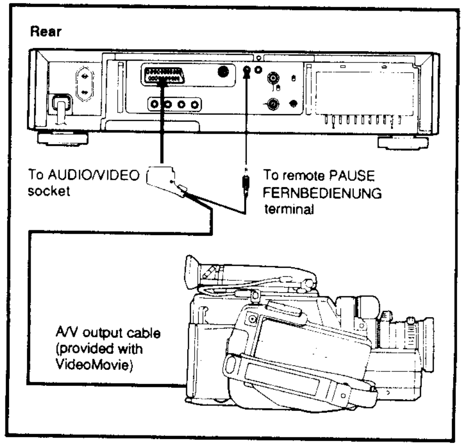
EDITING TO ANOTHER VIDEO RECORDER

This video recorder can also be used as the source player when editing tapes. This video recorder's remote PAUSE FERNBEDIENUNG terminal is designed to accept a preroll command when used as a source player with a video deck which is preroll-capable and equipped with a Pause Control Output terminal. This combination makes possible synchronized preroll editing for high-quality editing results.

EDITING FROM A VIDEOMOVIE

- Connect the VideoMovie's AV AUSG. connector to the video recorder's AUDIO/VIDEO socket.
- Connect the mini-plug of the AV output cable to the remote PAUSE FERNBEDIENUNG terminal of the video recorder.
- When the recorder is connected to a VideoMovie which incorporates a Master Edit Control system*, you can control the recorder with the VideoMovie's controls for making edits free of transition-point gaps and distortion. Refer to the VideoMovie's instruction manual for detailed operating procedures for editing.
- With this connection, you can also use the VideoMovie as a video camera for direct recording onto the recorder's tape. Put the recorder in the Record-Pause mode and operate the VideoMovie's start/stop trigger to start and pause recording. (For direct recording with a separate video camera, a camera adapter is necessary.)

*JVC dedicated models only.


Rear
To AUDIO/VIDEO socket
To remote PAUSE FERNBEDIENUNG terminal
A/V output cable (provided with VideoMovie)

DUET EDITING

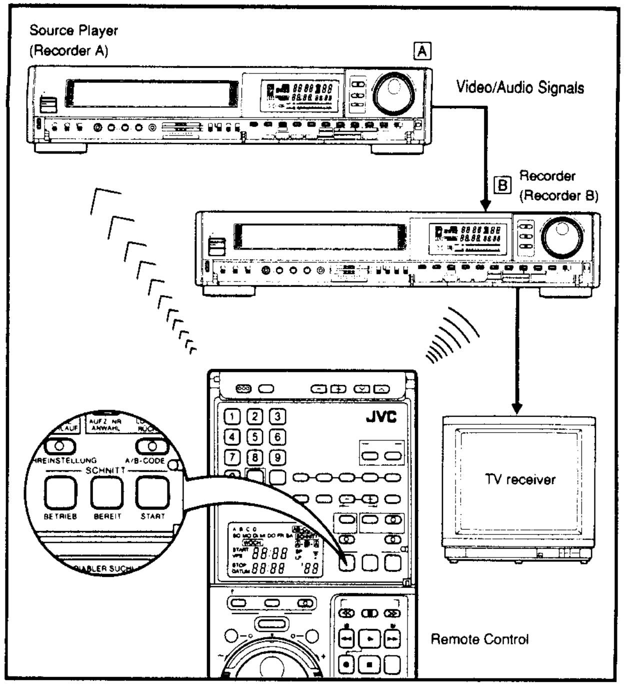
Designed specifically to simplify editing operations, the Duet Editing function delivers separate commands to two recorders simultaneously via a single remote control, taking advantage of the A/B code system. (JVC dedicated models only)

Preparations

- Connect two recorders as described in "RECORDING FROM AN EXTERNAL SOURCE" on the previous page.
- Set one recorder to respond to A code signals, the other, to respond to B code signals. (See page 48.)
- Place the two recorders side by side.

Notes:

- JVC video recorders with infrared remote control units which are not equipped with an A/B code select switch are designed to receive A code signals. Therefore, Duet Editing is possible with JVC decks if the HR-D960EG is set to respond to B code signals.
- It is not possible to perform Duet Editing unless the remote control's clock has been previously set.



OPERATION

Remote Control	Recorder A (Source player)	Recorder B (Recorder)
	Load a recorded tape.	Load a blank tape.
1. Press SCHNITT-BETRIEB. "SCHNITT Ⓐ → Ⓑ" appears on LCD.		
2. Press SCHNITT-BEREIT.	Enters Still mode.	Enters Record-Pause mode.
3. Search for an edit-in point on the source tape. Press ▮▮.	Functions as commanded. (In this state, only recorder A responds to the remote control's commands.)	Remains in Record-Pause mode.
4. Press SCHNITT-START.	Enters Play mode.	Enters Record mode.
5. Press ▮▮.	Enters Still mode.	Enters Record-Pause mode.
6. Repeat steps 3, 4 and 5 to continue editing.		

Notes:

- You can use Recorder B (the recorder set to respond to B code signals) as a source player and Recorder A as a recorder. In this case, press the A/B-CODE button after step 1 to obtain "SCHNITT Ⓑ → Ⓐ" indication.
- To cancel the Duet Edit mode and return to normal remote control functions, press the SCHNITT-BETRIEB button so that the SCHNITT indication disappears.
- When the START button is pressed, the recorder takes a few seconds before actual editing starts due to the automatic backspace editing system. At the same time the START button is pressed, the player starts playback from the specified edit-in point. Therefore, it is recommended that you specify a point slightly before the intended edit-in point in step 3 for more accurate editing. This also ensures that the picture of the resulting edit will be more stable.

PREROLL EDITING

Since the HR-D960EG comes equipped with a SCHNITT-VORLAUF switch and a PAUSE OUT terminal, synchronized preroll editing is possible for high-quality editing results. Preroll editing is possible with a preroll time of about 5 seconds when the HR-D960EG is used as the recorder and a second deck with a preroll-capable REMOTE PAUSE terminal is used as the player.

JVC's recorders with a preroll-capable REMOTE PAUSE terminal include: HR-D530, HR-D700, HR-D750, HR-S5000, HR-D520, HR-D600, HR-D620, HR-D830, HR-S5500, HR-D540, HR-D580, and HR-D860.

PREROLL ASSEMBLE EDITING

- **Set the SCHNITT-VORLAUF switch to ON.**

1. Play back the source tape and engage the Still mode at the edit-in point. (Player)
2. Play back the recording tape and engage the Still mode at the edit-in point. (HR-D960EG)
   - Use the SHUTTLE ring for search. Releasing it engages the Still mode.
3. Press the AUFN./NR. button of the recorder.
   - The recorder will preroll for about 5 seconds, after which it enters the Record-Pause mode. The monitor screen will show the still picture of the source tape.
4. Press the WIEDERG. button of the recorder.
   - The player will preroll for about 5 seconds while the recorder is standing by with its REC indicator blinking. Then the prerolled section will be played back on both decks and editing will start at the specified edit-in point.
5. Press the PAUSE/STANDB. button of the recorder to stop editing.
   - The recorder will preroll and stop in the Record-Pause mode.
   - The player will enter the Still mode.
6. Search for the edit-in point of a next edit on the source tape and engage the Still mode. (Player)
7. Press the WIEDERG. button of the recorder.
   - After prerolling, editing will start at the specified edit-in point.
8. Press the PAUSE/STANDB. button of the recorder to stop editing.
9. To continue assemble editing, repeat steps 6 through 8.
10. To end preroll editing, first press the player's STOP button and then the recorder's STOP button.

Note:

- A preroll command is given to the player by pressing the recorder's WIEDERG. button while in the Record-Pause mode. This function is available only with the first pressing of the button in the corresponding status. Therefore, do not press it until the player stands by at the edit-in point in the Still mode.

Connection

- Connect two decks using a 21-pin Euro-cable as illustrated on page 73.
- Connect the HR-D960EG's PAUSE FERNBEDIENUNG AUSG. terminal to the second deck's REMOTE PAUSE terminal using a mini-plug cable.

Tips for obtaining better results

The quality of the edited tape may vary depending on the position of the SCHNITT switch. It is recommended that you first make some trial recordings.

EIN
AUS
SCHNITT

- With the SCHNITT switch of the playback deck set to ON and recording deck to OFF.
- With the SCHNITT switch of both playback and recording decks set to ON, and
- With the SCHNITT switch of both decks set to OFF.

Choose the setting combination that best suits your preference.

PREROLL INSERT EDITING

Insert editing means recording a new scene into a section of pre-recorded tape so that a part of the original recording can be replaced with a new sequence without excessive picture distortion at edit-in and edit-out points. Thanks to the flying erase head, clean edits can be obtained.

> **Important**
> Since video and hi-fi audio signals are recorded simultaneously, both are replaced with new recordings simultaneously. The normal audio soundtrack remains unchanged. However, by using the insert editing and audio dubbing functions together, all signals can be replaced simultaneously.

- **Set the SCHNITT-VORLAUF switch to EIN.**

1. Play back the source tape and engage the Still mode at the edit-in point. (Player)
2. Play back the recording tape and engage the Still mode at the edit-in point (the beginning of the section to be replaced). (HR-D960EG)
   - Use the SHUTTLE ring for search. Releasing it engages the Still mode.
3. Press the INSERT button of the recorder.
   - The recorder will preroll for about 5 seconds, after which it enters the Insert Standby mode. The monitor screen will show the still picture of the source tape.
   - If the normal audio track is to be replaced, press the VERTONUNG button after completion of preroll.
4. Press the WIEDERG. button of the recorder.
   - The player will preroll for about 5 seconds while the recorder is standing by with its REC indicator blinking. Then the prerolled section will be played back on both decks and insert editing will start at the specified edit-in point.
5. Press the PAUSE/STANDB. button of the recorder to stop insert editing.
   - The recorder will preroll and stop in the Record-Pause mode.
   - The player will enter the Still mode.
6. To end preroll insert editing, first press the player's STOP button and then the recorder's STOP button.

Notes:
- Do not use the STOP button to stop insert editing. If you press the STOP button, the Insert Edit mode will be cancelled and distortion will result at the edit-out point.
- For automatic stop of insert editing, you can specify the edit-out point on the recording tape in advance. For this purpose, first locate the edit-out point (the end of the section to be replaced) and press the ZÄHLWERK RÜCKST. button. Then rewind to the edit-in point and start insert editing as described above. When the counter "zero" reading is reached, insert editing will stop automatically. The recorder will enter the Play mode and the player will enter the Still mode.
- The recording mode (SP or LP) is automatically determined by the previous recording onto which the new segment is inserted, regardless of the setting of the SP/LP button.
- If the recording mode changes from SP to LP, or vice versa, in a single edit, the inserted picture will be distorted at the switching point.
- If there is a non-recorded section on the recording tape, the Insert Edit mode will be cancellled automatically, and the recorder will switch to the Play mode while the player will enter the Still mode.

FADE-IN/FADE-OUT

To give a professional touch to your edited tape, the HR-D960EG has a built-in white fader.

Fade-in
- To start an edit with fade-in, press the FADER button, instead of the WIEDERG. button, to start editing from the Record-Pause mode.
- The edit will start with a blank white screen and fade in to normal in about 5 seconds.
- Keeping the FADER button depressed does not extend the fade-in time.

Fade-out
- To end an edit with fade-out, press the FADER button, instead of the PAUSE/STANDB. button, to stop editing.
- The picture will fade out in about 5 seconds, and the recorder will enter the Record-Pause mode.

> **Notes:**
> - Audio does not fade.
> - The FADER button has no effect on the playback or TV picture.
> - Fades cannot be applied to SECAM input signals.

IN CASE OF DIFFICULTY

What may initially appear to be trouble is not always a real problem. Make sure first ...

POWER AND TAPE TRANSPORT PROBLEMS

Symptoms	Check points
No power is applied to the recorder.	• Is the power cord disconnected? — Connect it.
Clock is functioning properly, but the recorder cannot be powered.	• Is the TIMER indicator lit on the FDP? — Press SCHALTUHR to disengage the Timer Recording Standby mode.
Tape does not run during recording.	• Is the PAUSE/STANDB. button engaged? — Press the WIEDERG. button.
Tape stops in the Rewind or Fast-Forward mode.	• Is the ZÄHLWERK-SPEICHER switch set so that "S" appears on the FDP? — Press to make "S" disappear.
Tape will not rewind or fast forward.	• Is the tape already fully rewound or fast forwarded? — Check the cassette.

RECORDING PROBLEMS

Symptoms	Check points
Recording cannot be started.	• Is a cassette loaded? • Is the safety tab on the cassette removed? — Reseal the slot with cellophane tape.
Camera recording is not possible.	• Are the camera and the camera adapter correctly connected? • Is the power switch of the camera adapter set to ON? • Does the channel display indicate "AU"? — Turn the JOG dial (first press KANAL/EINSTELLEN-AUSWAHL to obtain "AU" on the FDP.).
Simulcast recording is not possible.	• Has the SIMUL button been pressed? — Press it so "SIM" appears on the FDP. • Is an audio source correctly connected to the AUDIO EING. connectors? — Check connections.
Timer recording is not possible.	• Have you set the clock correctly and programmed the timer correctly? — Check once again. • Is the TIMER indicator lit on the FDP? — Press SCHALTUHR.

PLAYBACK PROBLEMS

Symptoms	Check points
Playback picture does not appear while the tape is running	• Is the TV receiver's channel selector set to the correct video channel? — Set it to the RF converter channel. (See page 49.) • If you are using AV connection, is the television engaged in the AV mode? — Operate the television's mode.
Playback is repeated.	• Is the WIEDERHOLUNG switch set to either "KOMPL." or "INDEX"? — Set it to "AUS".
Noise appears during playback.	• Is the automatic tracking mode engaged? — Engage the manual tracking mode. (See page 59.)
Playback picture is blurred or interrupted while TV broadcasts are clear.	• Video heads may be dirty. — Head cleaning is necessary. Consult your JVC dealer.

HI-FI AUDIO PROBLEMS

Symptoms	Check points
TV sound cannot be recorded on hi-fi audio track.	• Has the SIMUL button been pressed? — Press it again so "SIM" no longer appears on the FDP.
Soundtrack on the hi-fi audio track cannot be reproduced.	• Is the NORM indicator lit? — Press the Hi-Fi/NORM/MIX button for Hi-Fi L and R to light as required.

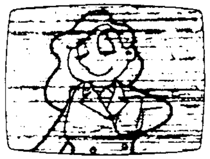
OTHERS

Symptoms	Check points
Whistling or howling is heard from TV.	• Move camera or microphone away from TV or reduce TV sound volume.
Some channels are skipped over when selecting a channel.	• Those channels are preset to be skipped over. If you need them, restore them. (See page 56.)
Channel cannot be switched.	• Is recording in progress? — Press PAUSE/STANDB., select a desired channel and press WIEDERG. .
The recorder cannot be operated with the remote control.	• Batteries are discharged. — Replace with new one. • Is the A/B-CODE indicator showing the proper code for the recorder being operated? — Press the A/B-CODE button to switch the remote control to the correct setting.
Index Search does not function properly.	• Adjacent index codes may be too close to each other. — Erase some index codes and mark new ones, if necessary, with sufficient distance between two index codes.

This recorder contains microcomputers. External electronic noise or interference could cause malfunctioning. In such cases, switch the power off and unplug the power cord. Then plug it in again and switch on. Take out the cassette. After checking the cassette, operate the unit as usual.

HEAD CLEANING

- Picture playback may become blurred or interrupted while the TV programme received is clear. This does not mean that the recorded programme has been erased.
- Dirt accumulated on the video heads after long periods of use causes such problems. In this case, head cleaning requiring highly technical care is necessary.



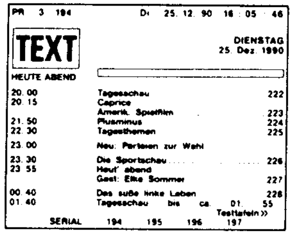
For head cleaning, consult the nearest JVC dealer.

TELETEXT COMPATIBILITY

Teletext services are becoming popular and a vast number of teletext pages are now available for a variety of information. This recorder is ready to take advantage of these services, not only for simple viewing but also for programming the recorder's built-in timer in an extremely easy way. All you need to do is connect the optional VPT or VPV adapter to the rear of the recorder. Then the recorder's remote control exhibits its full capability with all the dual or triple-function control keys working as intended. The following information shows examples of using the optional VPT adapter.

TELETEXT

- View broadcast teletext pages.
- Several page access modes are available for quick and convenient viewing.
- Programme the timer using TV schedule pages.



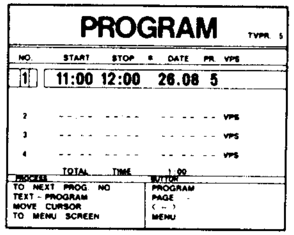
```
PR   3  194              Di  25. 12. 90  16 : 05 : 46

TEXT                                      DIENSTAG
                                      25. Dez. 1990
HEUTE ABEND

20. 00        Tagesschau                        222
20. 15        Caprice
              Amerik. Spielfilm                 223
21. 50        Plusminus                         224
22. 30        Tagesthemen                       225
23. 00        Neu: Parteien zur Wahl
23. 30        Die Sportschau ...........        226
23  55        Heut' abend
              Gast: Elke Sommer                 227
00. 40        Das süße linke Leben              228
01. 40        Tagesschau  bis  ca.  01.  55
                                    Testtafeln >>
        SERIAL    194     195     196     197
```

PROGRAM

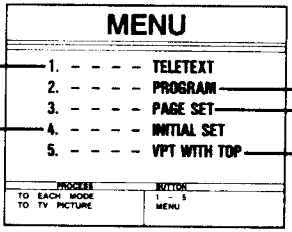
- Check the timer recording data on the colour display.
- Programme the timer manually with 10-key input.



```
              PROGRAM                TVPR. 5

NO.     START    STOP   *   DATE   PR. VPS
 1      11:00  12:00     26.08  5

 2      --.--  --.--     --.--  --  VPS
 3      --.--  --.--     --.--  --  VPS
 4      --.--  --.--     --.--  --  VPS
        TOTAL    TIME      1:00
PROCESS                  BUTTON
TO NEXT PROG. NO         PROGRAM
TEXT - PROGRAM           PAGE -
MOVE CURSOR              ( ← )
TO MENU SCREEN           MENU
```



```
           MENU

   1. - - - -  TELETEXT
   2. - - - -  PROGRAM
   3. - - - -  PAGE SET
   4. - - - -  INITIAL SET
   5. - - - -  VPT WITH TOP

   PROCESS            BUTTON
   TO EACH MODE       1 - 5
   TO TV PICTURE      MENU
```

PAGE SET

- Preset teletext pages so that you can quickly access your favourite or frequently-referred-to pages.
- Four pages can be preset for each of the keys, 0 to 9, totalling 40 pages.

INITIAL SET

LANGUAGE

- Select one of four languages (English, German, Italian or Swedish) for on-screen messages.

UHREINSTELLUNGUST

- Set the VCR's clock manually with 10-key input.
- Automatic clock setting by reading time information from teletext pages.

VPT WITH TOP

- TOP automatic teletext timer programming.
  - * "5. - - - - VPT WITH TOP" appears only when the VCR's tuner is tuned to a station which is transmitting TOP broadcasts. (Applicable only in certain areas.)

SECTION 1
DISASSEMBLY AND MECHANISM ADJUSTMENTS

1.1 DISASSEMBLY

1.1.1 Top cover

1. Refer to Fig. 1-1-1 and set for the EJECT (Stop) mode and disconnect VCR from AC power.
2. Take out 4 screws Ⓐ and 1 screw Ⓑ. To remove the top cover, slide it in the direction of the arrow and lift it away.

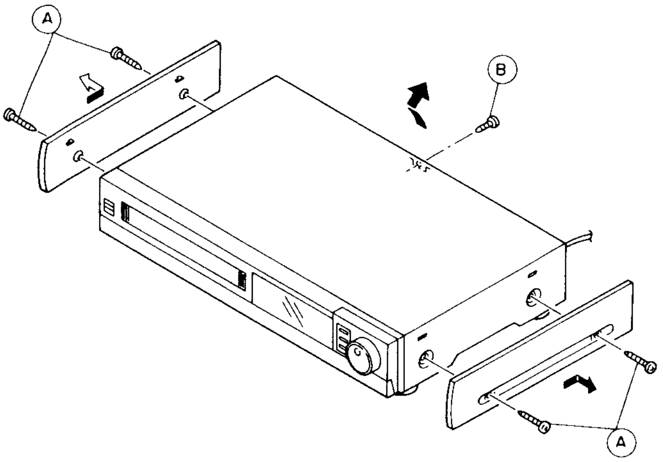


Fig. 1-1-1

1.1.2 Front panel assembly

1. Remove the top cover.
2. Carefully disengage 3 tabsⒸof the front panel assembly from the upper side of the chassis.
3. Refer to Fig. 1-1-2 and pull the front panel assembly forward you to disengage 3 tabs Ⓓ of the front panel assembly from the bottom side of the chassis, then remove the front panel assembly.

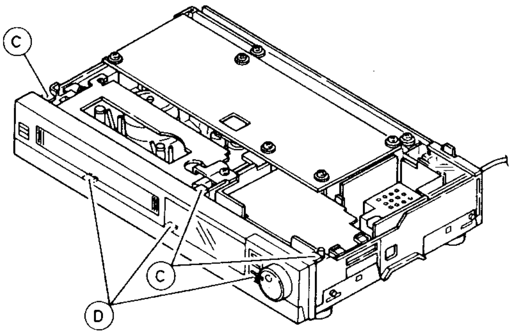


Fig. 1-1-2

1.1.3 Bottom cover

1. Remove the top cover.
2. Refer to Fig. 1-1-3 and take out 4 screws Ⓔ and 2 screws Ⓕ from the bottom of the chassis.
3. Disengage the bottom cover from 4 claws Ⓖ on the bottom of the chassis.

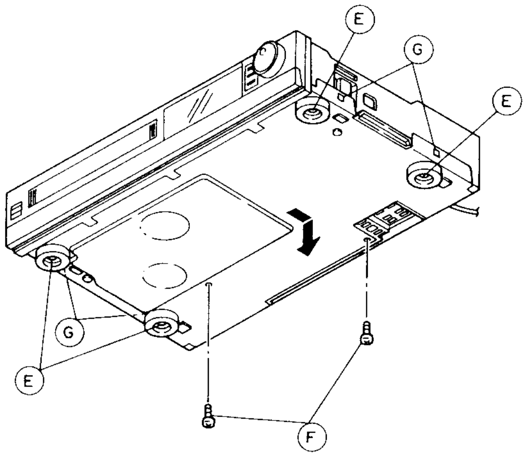


Fig. 1-1-3

1.1.4 Main board assembly

1. Remove the top cover.
2. Refer to Fig. 1-1-4 and take out 5 screws Ⓗ and 1 screw Ⓘ from main board assembly.

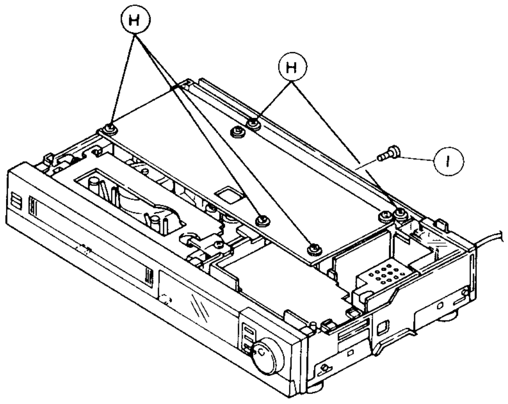


Fig. 1-1-4

1.1.5 Cassette housing

1. Remove the top cover and main board assembly.
2. Refer to Figs. 1-1-5 and 1-1-6.
   Take out 4 screws Ⓙ that secure the cassette housing. Disengage 3 tabs Ⓚ of the front panel and pull the front panel forward where it does not interfere with removing the cassette housing.
   Remove the cassette housing in the upward direction.

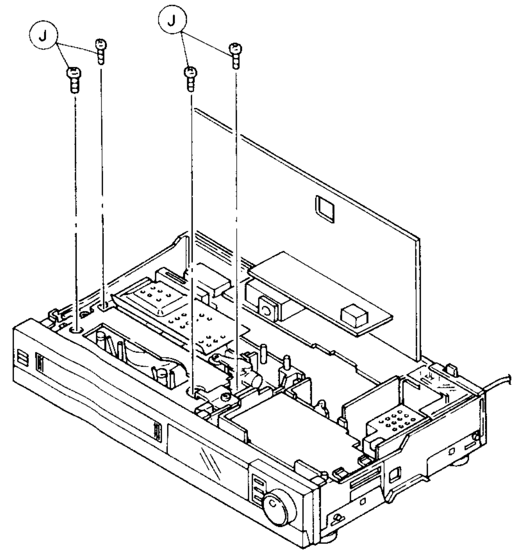


Fig. 1-1-5

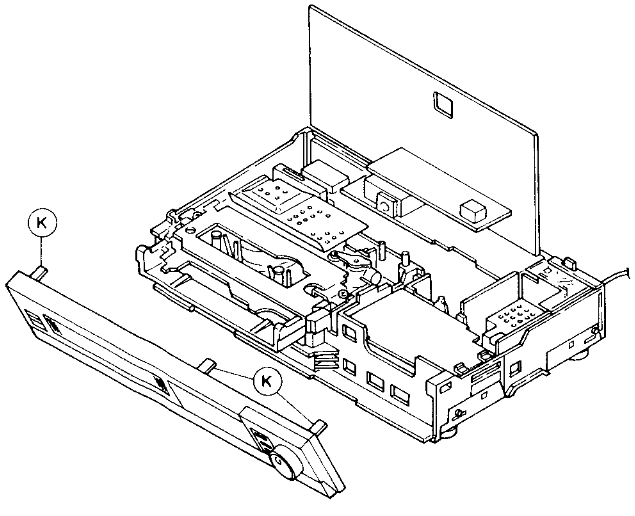


Fig. 1-1-6

1.1.6 Cassette housing installation

1. On the main deck, observe the positional relationships of the parts indicated in Fig. 1-1-7.
   If necessary, turn the loading motor by hand to obtain these positions.

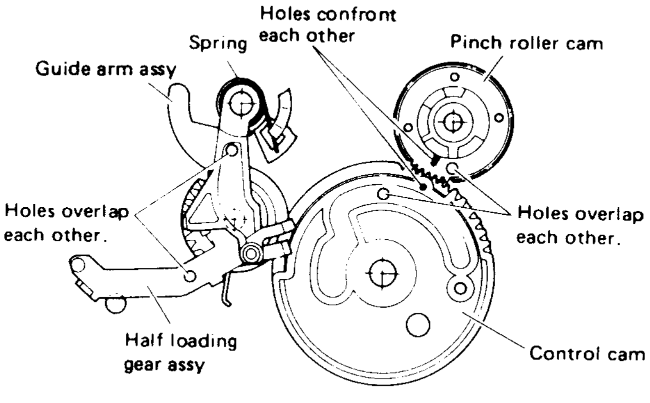

Holes confront each other
Spring
Pinch roller cam
Guide arm assy
Holes overlap each other.
Holes overlap each other.
Half loading gear assy
Control cam

Fig. 1-1-7

2. Refer to Fig. 1-1-8 and confirm that the clutch is engaged.
   If necessary, press the lever indicated by the arrow to where the clutch is locked.

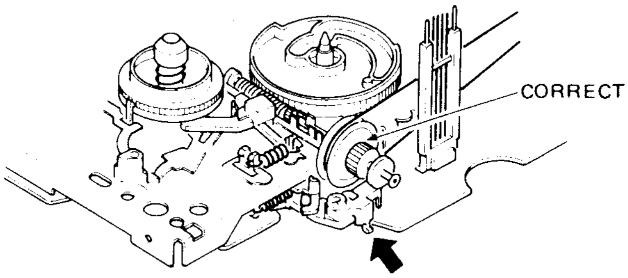


Fig. 1-1-8

3. Check that the cassette housing is in the eject state (internal holder of the cassette housing is locked in raised position).
   Set the cassette housing into place and secure with 4 screws.
4. Install the front panel as shown in Fig. 1-1-9 and re-engage the tabs. Supply power and use a spare cassette to check for normal loading and eject operations.

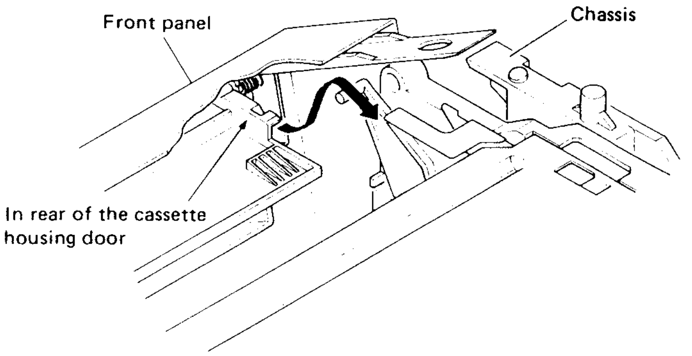

Front panel
Chassis
In rear of the cassette housing door

Fig. 1-1-9

5. Disconnect VCR from power, then reinstall the main board assembly and top cover.

1.1.7 Cassette housing door

1. Remove the top cover and front panel assembly.
2. Take out one screw Ⓛ of the front panel assembly.
3. Refer to Fig. 1-1-10 and use care regarding the torsion spring, then pull out the left end of the cassette housing door to move it.

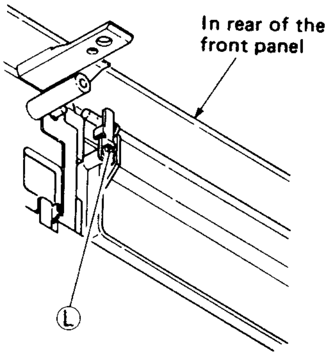


Fig. 1-1-10

1.1.8 Main-deck

1. Remove the top cover, front panel assembly and main board assembly.
2. Refer to Fig. 1-1-11 and take out 3 screws Ⓜ from the main-deck assembly.
3. Remove the main-deck assembly in the upward direction and disconnect a connector of CN601 from the Main board, connectors of CN1, CN2 from the Pre/Rec board, connectors of CN1, CN2 from the A/C head board, a connector of CN1 from the Loading MDA board and a connector of CN1 from the Drum MDA board.

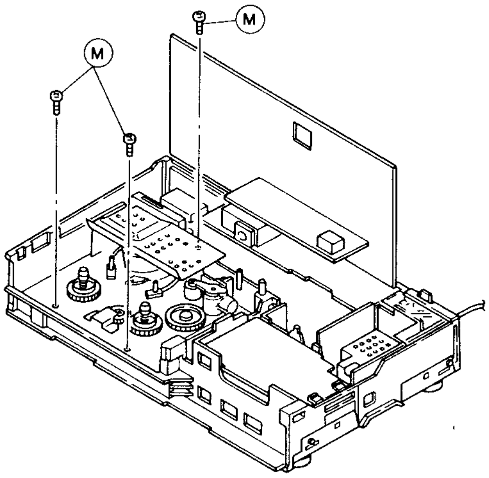


Fig. 1-1-11

1.2 MECHANISM ADJUSTMENTS

1.2.1 Precautions

1. Disconnect VCR from AC power before soldering.
2. Avoid imparting stress to wires when disengaging connectors.
3. Determine and correct the cause of difficulty before proceeding to adjustments. Do not disturb settings unnecessarily.
4. Use care not to damage tabs, claws, etc. during repairs.
5. Install the cassette housing assembly only when the mechanism is in the Eject or Stop mode position. In the Eject mode, the internal holder of the housing is fully raised. This is fully lowered in the Stop mode.
6. When installing the front panel assembly, be sure to engage the housing door with the door lever of the cassette housing assembly. If this is omitted, the door will not open at Eject and the cassette cannot be removed.

1.2.2 Check without cassette housing

Mechanism operations can be observed easily by removing the cassette housing assembly. Note the following.

1. Disable the photo transistor sensor (END SENSOR) on the main-deck by applying an opaque cover.
2. Connect pins 2 and 3 of Main board connector CN601.
3. Select the desired modes with the operation buttons. However, notice that without tape, setting for the reverse direction modes produces the Stop mode after a few seconds due to absence of the reel sensor output.

1.2.3 Manually removing cassette tape

In event of electrical system failure that prevents the tape from being unloaded, the tape can be removed manually by the following procedure. Refer to Figs. 1-3-1, 1-3-2 and 1-3-3.

1. Disconnect power cord from AC outlet.
2. Turn the loading motor by hand so that the control cam rotates clockwise. This retracts the pole base assembly to the unloading position.
3. Continue turning to where the guide arm and half loading gear assemblies shift to beneath the cassette.
4. Turn the clutch assembly at the rear of the deck to absorb slack tape within the cassette.
5. Again turn the loading motor in the same direction to raise the cassette and remove it.

1.2.4 Test equipment

The following special tools and fixtures are required for mechanism adjustment.

1. Alignment tapes : MH-2 and MH-2L
   Stairstep signal is employed for interchangeability checks and adjustments.
2. Torque gauge : PUJ48075-2
   Measures tape take-up torque.
3. Back tension cassette gauge : PUJ48076-2
   Measures tape tension at the supply side.
4. A/C head positioning tool : PUJ47351-2
   Shifts the head base for adjusting the control head position.
5. Roller driver : PTU94002
   Turns the guide roller for adjusting FM linearity.
6. Presetting unit: PTU94008
   Use for LP auto tracking preset adjustment.

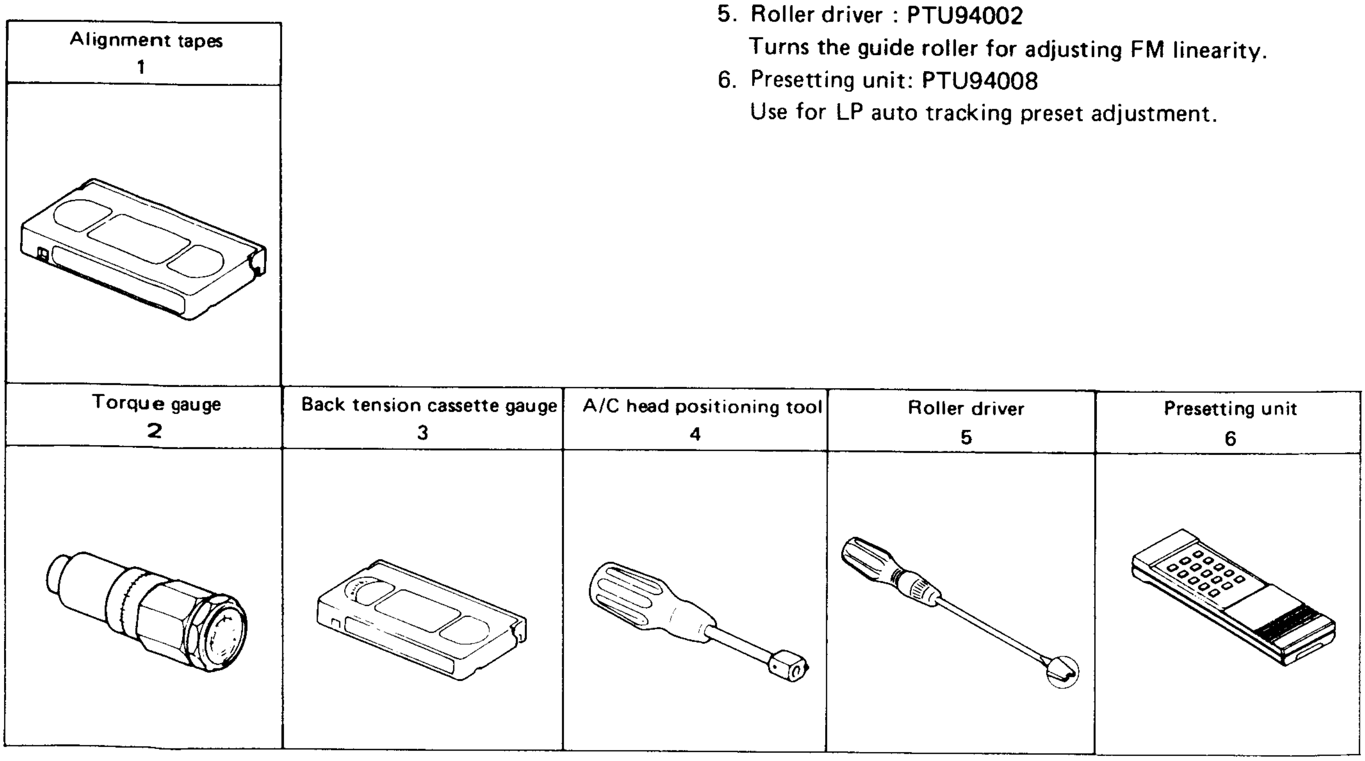


Fig. 1-2-1 Test equipment

1.3 MAIN MECHANISM PARTS

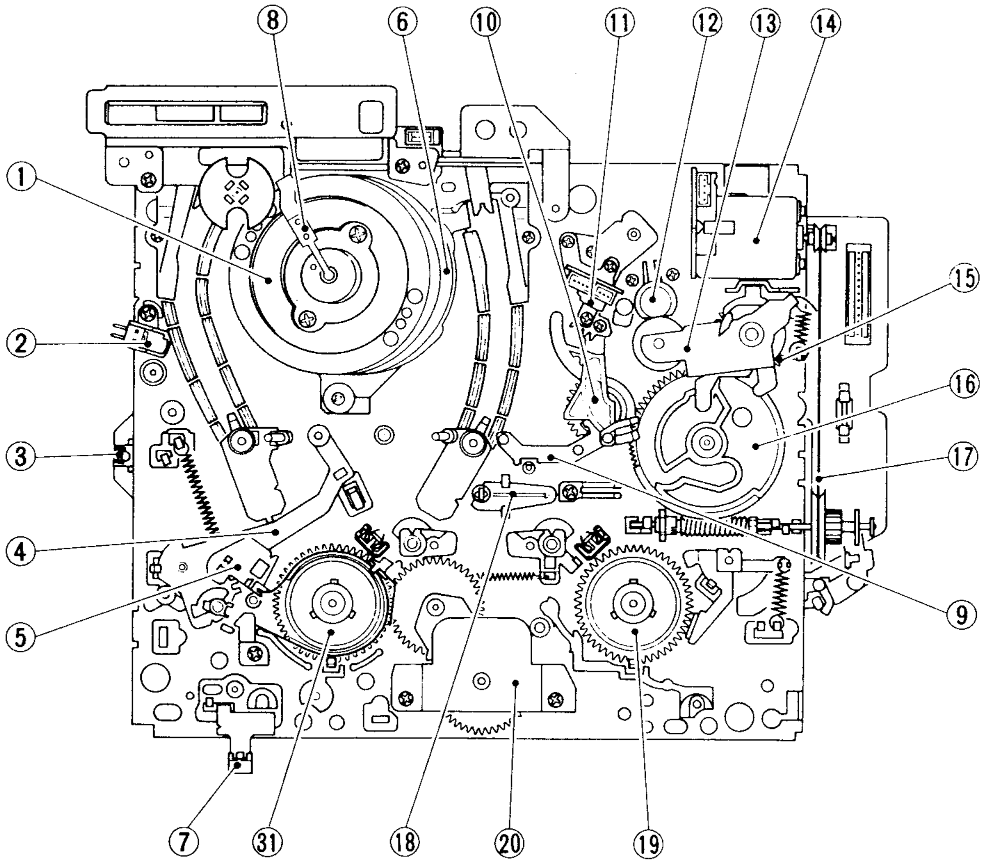

⑧
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Fig. 1-3-1 Top view of main-deck

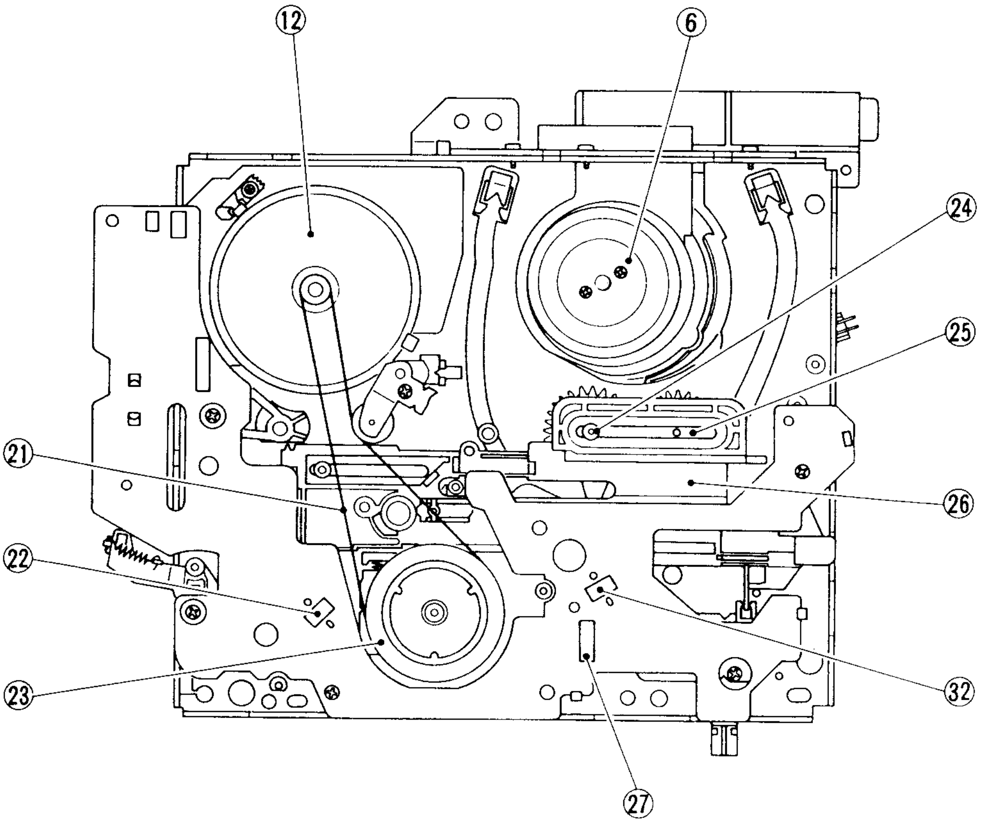
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Fig. 1-3-2 Bottom view of main-deck

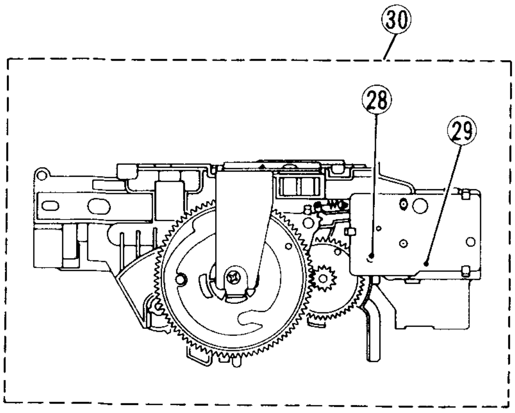


Fig. 1-3-3 Side view of cassette housing

A. Cleaning

Periodic cleaning of the tape transport system is desirable, but ordinarily not feasible in practice. Therefore, perform cleaning when a set is brought in for repairs or maintenance. Contamination of the video heads, tape guides and brushes can detract from playback picture quality and in extreme cases, even damage the tape. For cleaning, use a fine-mesh cotton cloth (about the texture of a white dress-shirt) moistened in alcohol.

- To clean the video heads, press the moistened cloth gently against the upper drum with fingertip and turn the drum by hand.
- Do not use a vertical stroke, as this may damage the heads.

B. Lubrication

Oil and grease do not normally require periodic replenshing. Apply only when replacing lubricated parts (also clean and replace lubrication of mating parts if soiled).

For parts and points to apply oil and grease, refer to the exploded views of the mechanism assembly.

Before oiling, clean with alcohol.
Apply one or two drops of oil. Avoid excess oil.

1. Table 1-1 indicates the oil and grease used in this set. Use these or recommended locally available equivalents.

Category	Part No.
Oil	COSMO-HV56
Grease	KANTO-G-31KAV

Table 1-1

2. Grease is not required for a replacement cassette housing assembly, as this has been applied at the factory.

Note: *Stir grease that has been stored for an extended period.*

C. Main mechanical parts

See Figs. 1-3-1, 1-3-2 and 1-3-3.

No.	Symbol	Parts Name	See Section
1	M32A	Upper drum assy	
2	M44	Full erase head	
3	51Q1	End sensor	
4	M41	Tension arm assy	1.5.4
5	M42	Tension band assy	1.5.4
6	M32C	Lower drum motor assy	1.5.2
7	M461	REC safety switch (S2)	
8	M32D	Brush assy	
9	M449	Half loading gear assy	1.5.5
10	M447	Guide arm assy	1.5.5
11	M48	A/C head	1.5.3
12	M422	Capstan motor	
13	M442	Pinch roller arm assy	
14	M434	Loading motor assy	
15	M446	Pinch roller cam	1.5.5
16	M438	Control cam	1.5.5
17	M437	Loading belt	
18	M460	LED holder (D1)	
19	M430	Reel disk (take-up)	
20	M424	Idler gear unit	
21	M429	Timing belt	
22	51PHS1	Take up reel sensor (PS1)	
23	M426	Clutch unit	1.5.6
24	M433	Take up loading arm assy	1.5.7
25	M432	Supply loading arm assy	1.5.7
26	M439	Plate assy	1.5.7
27	M462	Slide switch (S3)	
28	56PHS3	Cassette sensor (PHS3)	
29	56Q2	Start sensor (Q2)	
30	M36	Cassette housing assy	
31	M470	Reel disk (supply)	
32	51PHS2	Supply reel sensor (PS2)	

- Symbol interpretation example

M32A
M32 — Exploded view symbol
A — Ref. No.

56 Q2
56 — Board No.
Q2 — Ref. No.

1.4 INSPECTION AND MAINTENANCE

This product employs rotary and moving parts which wear out in the course of usage. Periodic inspection, cleaning, lubrication and maintenance are therefore important for ensuring maximum performance. Worn parts must also be replaced at when required.

1.4.1 Suggested servicing schedule for main components

The following table indicates the suggested period for such service measures as cleaning, lubrication and replacement. In practice, the indicated periods will vary widely according to environmental and usage conditions. However, the indicated components should be inspected when a set is brought for service and the maintenance work performed if necessary.

Also note that rubber parts may deform in time, even if the set is not used.

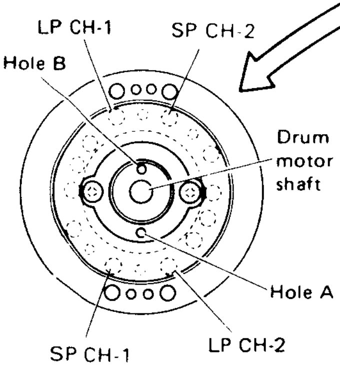
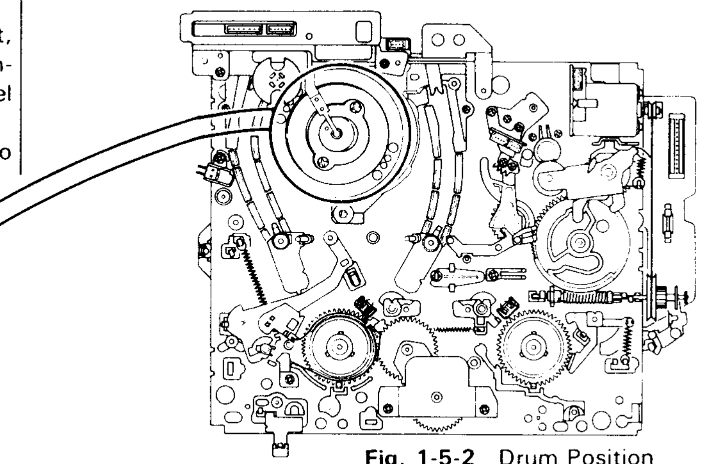
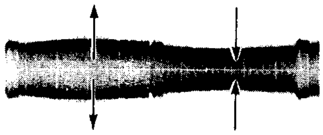
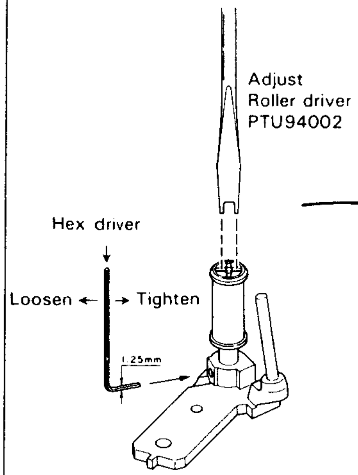
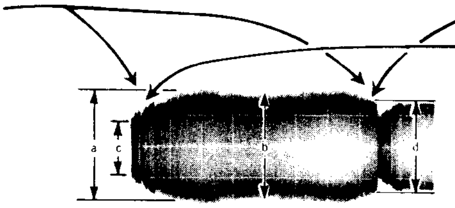
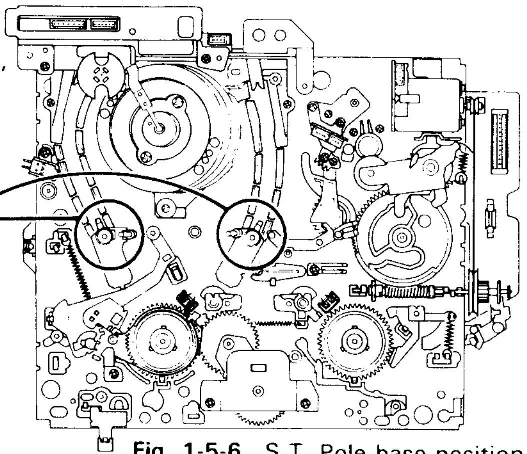
System	No.	Parts Name	Symbol No.	Periodic servicing schedule (operation hours)								
				250	500	750	1000	1250	1500	1750	2000	Overhaul
Tape Transport	1	Upper drum	M32A	★	★	☆	○	○	○	○	○	●
	11	A/C head	M48	★	★	★	○	○	○	○	○	●
	13	Pinch roller	M442	★	★	★	○	○	○	○	○	●
	2	Full erase head	M44	★	★	★	○	○	○	○	○	●
	4	Tension arm	M41									●
	6	Lower drum	M32C				○	○	○	○	○	●
	12	Capstan (shaft)	M422	★	★	★	★	★	★	★	★	●
	9	Half loading gear	M449									●
	10	Guide arm	M447									●
Drive	12	Capstan motor	M422				○	○	○	○	○	●
	17	Loading Belt	M437				○	○	○	○	○	●
	21	Reel Belt	M424				○	○	○	○	○	●
	19	Take-up reel disk	M430				○	○	○	○	○	●
	31	Supply reel disk	M470				○	○	○	○	○	●
	23	Clutch assy	M426								○	●
	14	Loading motor	M434				○	○	○	○	○	●
		Worm clutch assy	M436								△	●
	26	Plate assy	M439								△	●
Others	5	Tension band	M42				○				○	●
	8	Brush	M32D				○				○	●

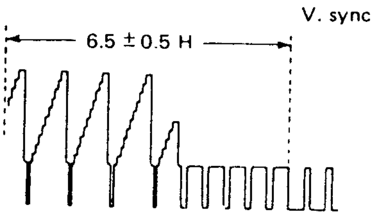
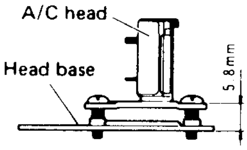
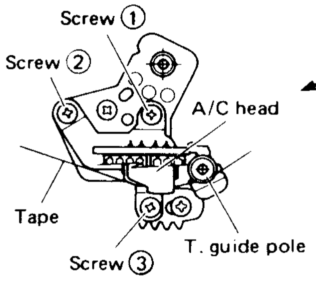
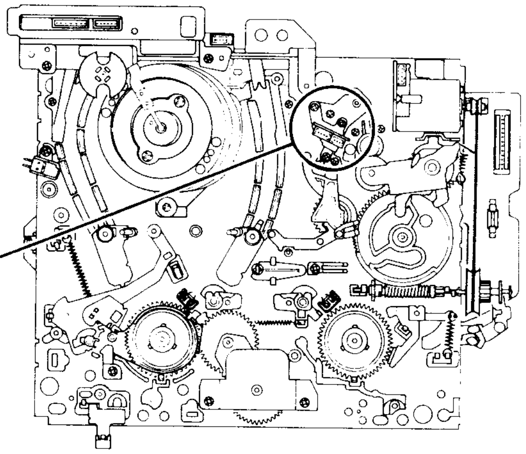
★ : Cleaning
☆ : Cleaning (or Replacement if necessary)
△ : Lubrication
No: Refer to Main mechanical parts

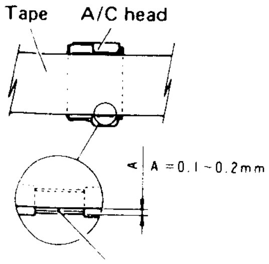
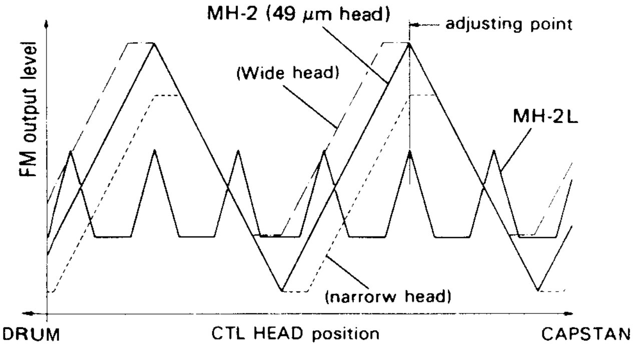
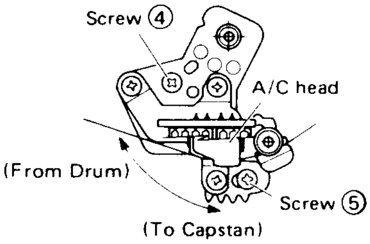
▲ : Lubrication (or Replacement if necessary)
● : Replacement
○ : Inspection or Replacement if necessary

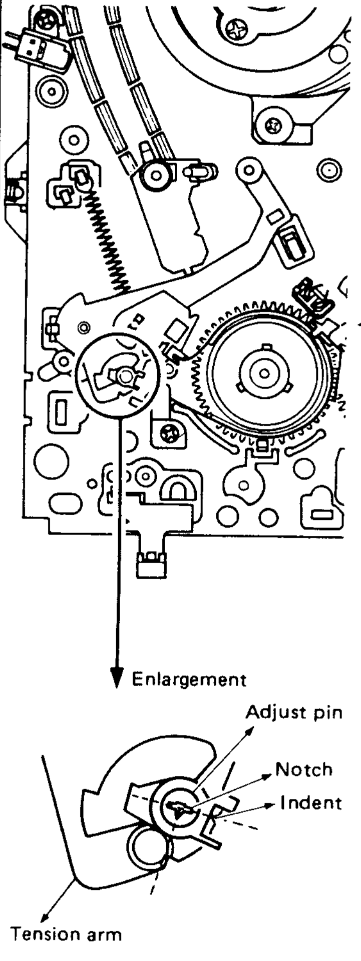
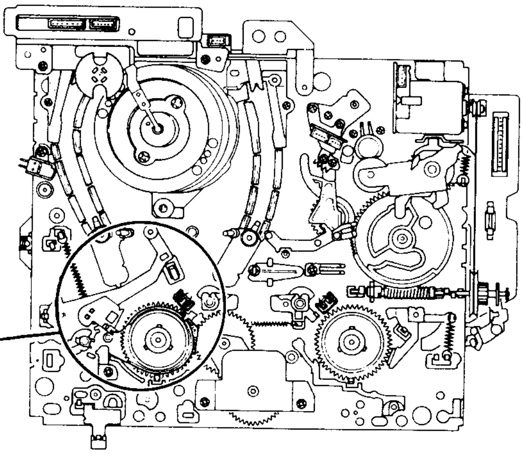
Table 1-4-1 Approximate maintenance schedule

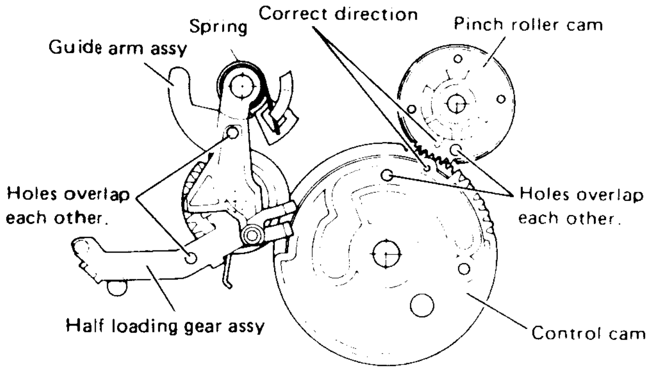
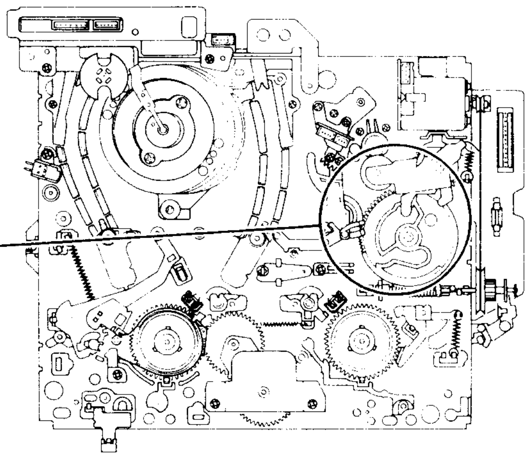
1.5 MAIN PARTS REMOVAL AND REPLACEMENT

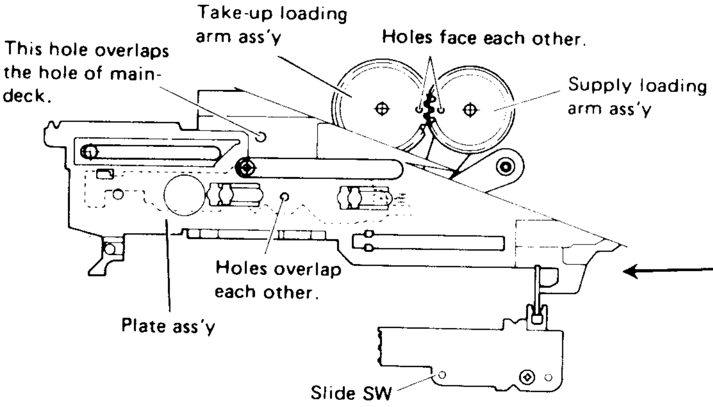
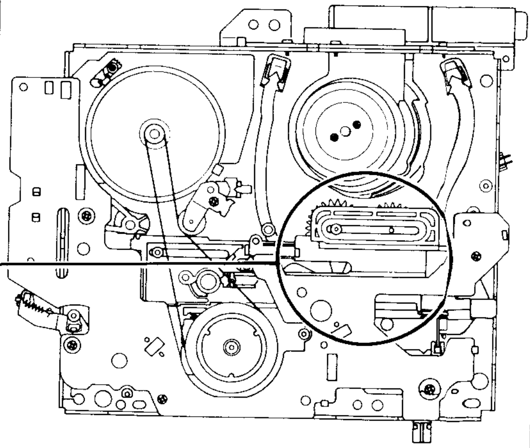
No.	Item	Checkpoints	Adjustment and Checks
1	Upper drum assembly • Symptoms: FM signal absent, intermittent or weak on one channel; large difference in channel output levels • Cause: Worn or damaged video heads, poor response, etc.  LP CH-1 SP CH-2 Hole B Drum motor shaft Hole A SP CH-1 LP CH-2 **Fig. 1-5-1** DRUM TOP VIEW	 **Fig. 1-5-2** Drum Position Mounting direction See Fig. 1-5-1. (Symptom: no picture)	After replacing, observe that upper drum hole A is opposite the motor axis from lower drum hole B.
		Axis wobble See Fig. 1-5-2. (Symptom: jitter, poor FM linearity) PB FM: Main board TP206 FF: Main board TP411	Record and playback in LP mode. Confirm absence of large difference between channels. (Fig. 1-5-3)  **Fig. 1-5-3** Axis wobble
	 Adjust Roller driver PTU94002 Hex driver Loosen Tighten 1.25mm **Fig. 1-5-4** S.T. Pole base	FM linearity check See Fig. 1-5-5. (Symptom: vertical sync absent, picture noise) PB FM: Main board TP206 FF: Main board TP411  **Fig. 1-5-5** FM linearity $\frac{b}{a} \geqq 0.7,\ \frac{c}{a} \geqq 0.65,\ \frac{d}{a} \geqq 0.65$	 **Fig. 1-5-6** S.T. Pole base position 1) Play stairstep signal of the MH-2 Alignment Tape. Confirm absence of obvious FM waveform loss and that operating the Tracking yields the optimum point. 2) Refer to Fig. 1-5-4, adjust for loss at the left edge (drum entry) of the FM waveform by turning the guide roller of the supply pole base. Similarly, adjust for loss at the right edge (drum exit) by turning the guide roller of the take-up pole base. **Note:** *If FM loss occurs on both channels and cannot be corrected by adjusting the guide rollers, the lower drum needs replacement.*

No.	Item	Checkpoints	Adjustment and Checks
	PB switching point •Symptom: switching noise at picture bottom.	VIDEO OUT  **Fig. 1-5-7** PB Switching Point	1) Connect an oscilloscope to VIDEO OUT. 2) Set the MH-2 alignment tape into the cassette housing. Play back the stairstep segment of MH-2 alignment tape. 3) Trigger the oscilloscope externally (– slope) with the signal from TP411 (DRUM FF) of the main board. 4) Adjust R420 to position the trigger point 6.5 H ±0.5 H from V. sync as shown in Fig. 1-5-7.
2	Lower drum assembly •Symptoms: Poor FM linearity, noisy rotation, jitter •Cause: Lead and bearing wear	Check FM linearity and switching point.	See above upper drum assembly items.
		Check control head phase (X value) Symptom: tracking error PB FM: Main board TP206 FF: Main board TP411	1) Play stairstep signal of MH-2 and MH-2L Alignment Tapes. Engage the Tracking Preset mode by pressing the + and – buttons simultaneously in the onscreen mode. Confirm that the same maximum FM waveform level is obtained as when the tracking is adjusted manually. 2) Refer to the A/C head adjustments.
3	**A/C head**  **Fig. 1-5-8** Temporary height  Screw ① Screw ② A/C head Tape Screw ③ T. guide pole **Fig. 1-5-9** Inclination/Azimuth/ Height adj.	 **Fig. 1-5-10** A/C HEAD position	
		Temporarily set height as indicated in Fig. 1-5-8.	Set the height as indicated in Fig. 1-5-8 to facilitate tape transport checks and adjustments.
		Tilt (forward inclination) See Fig. 1-5-9. (Symptom: audio level varies greatly.)	1) Run tape, turn screw ① counterclockwise to where slight curling of the tape occurs at the lower flange of the take-up guide roller. 2) Then slowly turn the screw clockwise to where the curling ceases.
		Azimuth See Fig. 1-5-9. (Symptoms: audio low level or noisy) Audio output: Main board AUDIO OUT	1) Play stairstep signal (with audio 6 kHz) of the MH-2 Alignment Tape. Observe audio output signal with oscilloscope. 2) Turn screw ② and adjust for maximum audio output level.

No.	Item	Checkpoints	Adjustment and Checks
	 **Fig. 1-5-11** Height Adj	Height See Figs. 1-5-9 and 1-5-11. (Symptom: low audio and control signal levels)	1) Run tape and observe the control head area. 2) Turn screws ①, ② and ③ by small and equal amounts until 0.1 to 0.2 mm of the head core bottom can be seen. **Note:** *If difficult to observe, play stairstep signal of MH-2 Alignment Tape and adjust for maximum audio output and control pulse level.*
		FM linearity	Refer to upper drum assembly items. If adjustment is major, again check the azimuth.
	 **Fig. 1-5-13** CTL head phase **Note:** *Trigger the oscilloscope externally signal from TP411 (DRUM FF). Use (+) trigger for MH-2 and MH-2L alignment tape.*	Control head phase See Fig. 1-5-12. PB FM: Video board TP206 FF : Video board TP411  Screw ④ A/C head (From Drum) Screw ⑤ (To Capstan) **Fig. 1-5-12** CTL head phase	1) Play stairstep signal of MH-2 Alignment Tape and observe the FM waveform. Set for Tracking Preset by pressing the + and – buttons simultaneously in the onscreen mode. 2) Loosen screws ④ and⑤. Set the A/C head positioning tool on screw ④, with the stud inserted into the nearby oblong hole. 3) Turn the tool first to position the A/C head fully toward the capstan. Then gradually return it toward the drum and stop at the position of maximum FM waveform output level as shown in Fig. 1-5-13. 4) Tighten screw ⑤ . Remove the tool and tighten screw ④. 5) Play stairstep signal of MH-2L Alignment Tape and confirm maximum FM waveform output level as shown in Fig. 1-5-13. 6) If not maximum, slightly loosen screws ④ and ⑤. Use the tool and adjust the head position for the nearest maximum point. Then tighten screws ④ and ⑤.

No.	Item	Checkpoints	Adjustment and Checks
		LP auto tracking adjustment	1) Terminate the video output at 75 ohms with a monitor-TV and connect oscilloscope to PB FM (TP206). 2) Set MH-2L Alignment Tape into the cassette housing and play the stairstep signal. 3) Confirm that the A/V digital tracking LED changes from flashing to lighted. 4) Press button "D" of the preset unit (PTU94008) to extinguish the A/V digital tracking LED. 5) Again press button "D" to enter the LP interchangeability adjust mode. Confirm that the A/V digital tracking LED changes from flashing to extinguished. Press the stop button. **Note:** *If the Alignment Tape ejects automatically, repeat the control head phase adjustment.*
4	Tension arm assembly Tension band assembly  **Fig. 1-5-14** Tension arm assy	Tension pole position See Fig. 1-5-14. (Symptom: poor FM waveform response)	 **Fig. 1-5-15** Tension arm position 1) Check that the cassette housing is in the eject state (internal holder of the cassette housing is locked in raised position). 2) Turn the eccentric adjust pin to align the notch of the pin with the tension arm indent as shown in Fig. 1-5-14.
		Back tension (Symptom: skew)	1) When the tension pole position is correctly adjusted, the back tension will assume the correct value. 2) Use the Back Tension Cassette Gauge and set for the playback mode. Confirm reading of 35 to 48. 3) Changing the tension pole position in order to vary the back tension will cause adverse effects elsewhere.

No.	Item	Checkpoints	Adjustment and Checks
5	Pinch roller cam Control cam Half loading gear assembly Guide arm assembly		Set mechanism to Eject mode (internal holder of the cassette housing is locked in raised) position.
	 Correct direction Spring Guide arm assy Pinch roller cam Holes overlap each other. Holes overlap each other. Half loading gear assy Control cam Fig. 1-5-16 Control/Pinch roller cam		 Fig. 1-5-17 Control cam position
		Important: Do not remove or disturb parts other than those mentioned. See Fig. 1-5-16.	1) When installing the pinch roller cam, overlap the largest hole of the gear portion with the hole of the deck. 2) Set the control cam on the deck with the hole of the groove overlapped with the hole of the deck. Observe that the small hole of the control cam and the ridge of the pinch roller cam are aligned. (If the control cam does not fit readily, shift the rear plate assembly within the range of play.) 3) Install the half loading gear assembly with the hole overlapped with the hole of the deck. Secure with E-ring. 4) Install the guide assembly over the spring and with the hole overlapping that of the deck. Engage the spring correctly.
		Cassette housing assembly	Install the cassette housing assembly with the mechanism in the Eject mode. Also observe that the inner holder of the housing is raised and locked.
6	Clutch assembly	Take-up torque (Symptom: inadequate take-up torque)	1) Remove cassette housing and set for playback mode (see Section 1.2). 2) Set torque gauge on the take-up reel disk. Gradually relax your grip on the gauge and read the needle indication at the point the gauge begins to rotate with the disk. Confirm indication of 60 to 100.

No.	Item	Checkpoints	Adjustment and Checks
7	Take-up loading arm assembly Supply loading arm assembly Plate assembly		Note: • *Set mechanism to the Eject or Stop mode before removing these parts.* • *The flange of the plastic rivet securing the loading arm assembly and the pole base assembly can be damaged by attempting to remove it directly. Press the loading arm assembly firmly to prevent motion. Then use a narrow-shafted tool to press the rivet from the shaft end to remove it.*
		Mounting position alignment • Remove the tension arm assembly to facilitate operation. See Fig. 1-5-18.	1) Set the supply and take-up loading arm assemblies so that the holes of the gear portions are aligned, then secure to the pole base assemblies with rivets. 2) Shift the plate assembly and install with the holes of the upper and lower components overlapped.
		Slide switch See Fig. 1-5-18.  Take-up loading arm ass'y This hole overlaps the hole of main-deck. Holes face each other. Supply loading arm ass'y Holes overlap each other. Plate ass'y Slide SW Fig. 1-5-18	Be sure to engage the slide switch slider with the edge of the plate assembly.  Fig. 1-5-19 T.S. Loading arm position

SECTION 2
ELECTRICAL ADJUSTMENTS

2.1 PREPARATION

Electrical adjustments are required after replacing circuit components and certain mechanical parts.
It is important to perform these adjustments only after all repairs and replacements have been completed. Also, do not attempt these adjustments unless the proper equipment is available.

2.1.1 Required test equipment

1. Colour television or monitor
2. Oscilloscope: wide-band, dual-trace, triggered delayed sweep
3. Frequency counter
4. Audio oscillator
5. Audio voltmeter
6. Digital voltmeter
7. Signal generator: RF/IF sweep/marker
8. Signal generator: PAL colour bar, stairstep, video sweeper
9. Signal generator: Audio multiplex TV signal generator
10. Recording tape
11. Alignment tape: MH2, MH-2L
12. Presetting unit: PTU94008

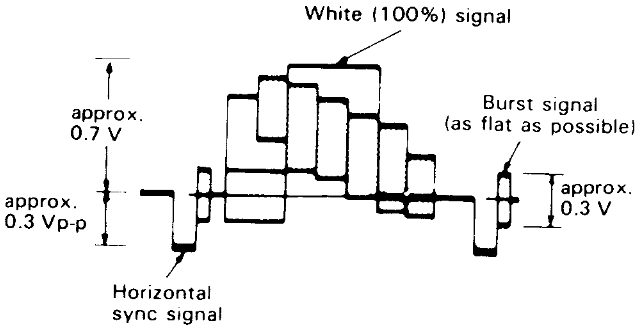

White (100%) signal
Burst signal (as flat as possible)
approx. 0.7 V
approx. 0.3 Vp-p
approx. 0.3 V
Horizontal sync signal

Fig. 2-1-1 Colour bar signal of pattern generator

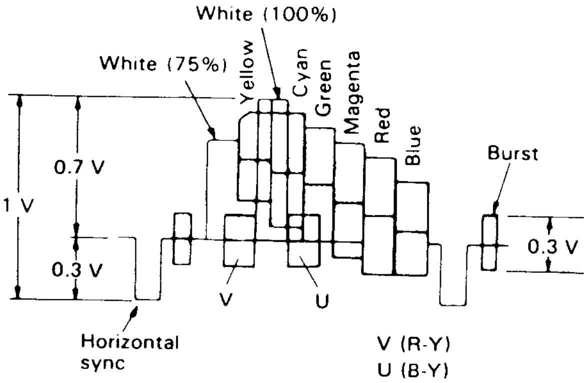

White (100%)
White (75%)
Yellow
Cyan
Green
Magenta
Red
Blue
Burst
0.7 V
1 V
0.3 V
0.3 V
V
U
Horizontal sync
V (R-Y)
U (B-Y)

Fig. 2-1-2 Colour bar signal waveform

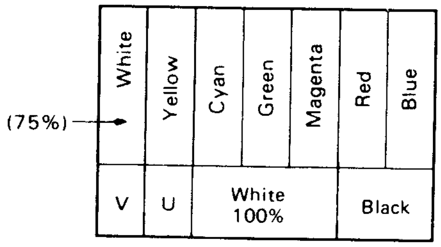

White
Yellow
Cyan
Green
Magenta
Red
Blue
(75%)
V
U
White 100%
Black

Fig. 2-1-3 Colour bar pattern

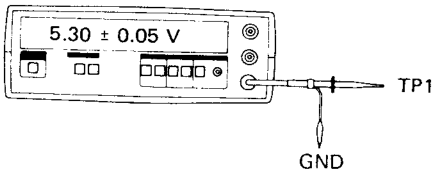
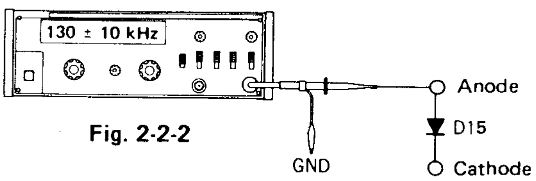
2.1.2 Check and adjustment steps

The check and adjustment steps are provided in the following in the form of charts. For clarity, the nomenclature used in the charts is outlined below.

No.	Checks and adjustments are numbered in the recommended sequence in which they are to be performed.
Item	Name assigned to the particular check and adjustment step.
Check Point	Location to which measuring instrument (oscilloscope unless otherwise noted) is to be connected.
Adjustment Parts	Variable component (resistor, capacitor, etc.) to be adjusted in this step. Dash (–) indicates check only.
Signal & Mode	• Input signal required to perform adjustment. Dash (–) indicates that special signal is not required. • Equipment operating mode at time of check or adjustment.
Colour bars	Colour bars signal as video input.
Stairstep	Stairstep signal as video input.
1 kHz	1 kHz sinewave as audio input signal.
MH-2 colour bars	Colour bars segment of MH-2 alignment tape.
MH-2 stairstep	Stairstep segment of MH-2 alignment tape.
MH-2 1 kHz	1 kHz audio signal segment of MH-2 alignment tape.
MH-2 RF sweep	RF sweep segment of MH-2 alignment tape.
MH-2L colour bars	Colour bars segment of MH-2L alignment tape.
MH-2L stairstep	Stairstep segment of MH-2L alignment tape.
MH-2L RF sweep	RF sweep segment of MH-2L alignment tape.
E-E	Power on and machine in Stop mode.
REC	Recording mode
PB	Playback mode
SEARCH	Search (FWDS and REVS) playback mode
SLOW	Slow motion playback mode
STILL	Pause during playback mode
SP mode	SP recording speed
LP mode	LP recording speed.
Description	This column provides an explanation of the step, notes and adjustment values, and reference to waveforms where applicable.

2.2 SWITCHING REGULATOR CIRCUIT

Note: *Unless otherwise specified, all test points and adjustments are located on the SWITCHING REG board.*

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	5V DC output voltage	TP1 (INPUT) TP3 (GND)	R37 (5V DC)	• Tuner mode • REC • SP mode	1) Set recording video cassette into the cassette housing and set for the REC mode. 2) Connect a digital voltmeter as shown in Fig. 2-2-1. 3) Adjust R37 for 5.30 ± 0.05 V. Digital Voltmeter  **Fig. 2-2-1**
2	Confirmation of oscillation Frequency counter  **Fig. 2-2-2**	Anode of D15		• Tuner mode • REC • SP mode	1) Set recording video cassette into the cassette housing and set for the REC mode. 2) Connect a digital voltmeter as shown in Fig. 2-2-2. 3) Confirm that oscillator frequency is 130 ± 10 kHz.

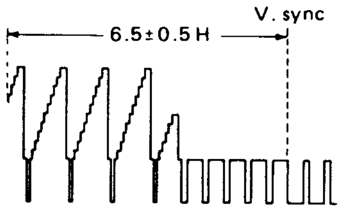
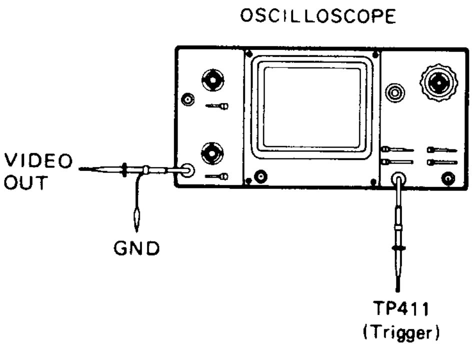
2.3 TIMER CIRCUIT

Note: *Unless otherwise noted, all test points and adjustments are located on the TIMER board.*

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	Timer clock	IC1-16	C6 (Clock)	•E-E	**Note:** ***For below adjustments use 10:1 probe with input capacitance lesst han 100 pF.*** 1) Disconnect VCR from AC. Connect a frequecy counter between IC1-16 and GND. 2) Short TP1 to GND, then short the leads of capacitor C3 once in order to reset IC1. 3) Connect VCR to AC. All FDP Segments are on. 4) Adjust C6 for 2048.000 ± 0.002 Hz (488.2808 to 488.2818 μs).

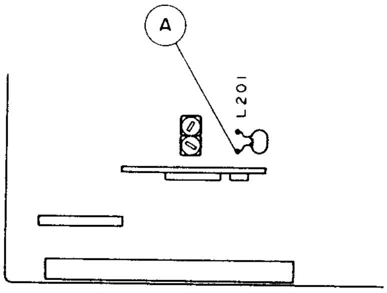
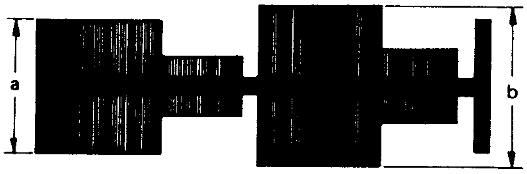
2.4 SERVO CIRCUIT

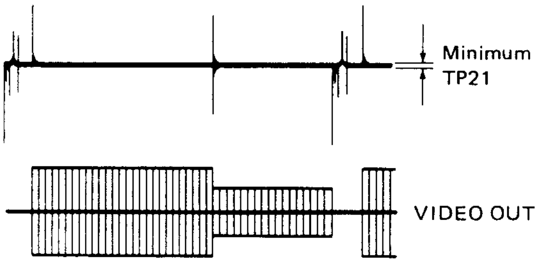
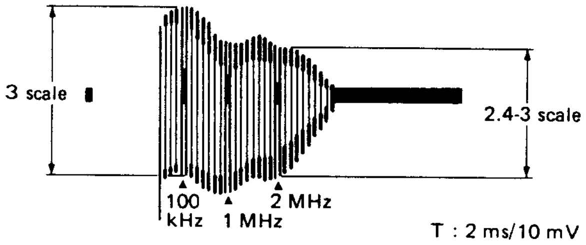
Note: *Unless otherwise specified, all test points and adjustments are located on the MAIN board.*

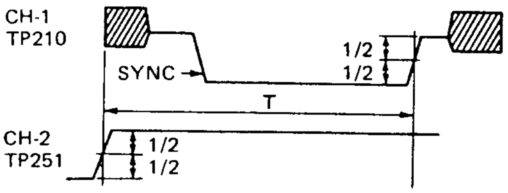
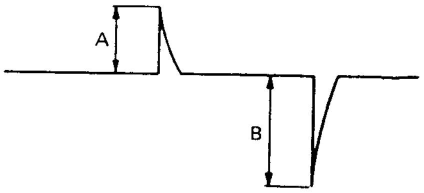
No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	SP PB switching point	VIDEO OUT  	R420	• PB • MH-2 (stairstep) • Trigger slope (–) • SP mode • AUTO TRACKING OFF	1) Connect an oscilloscope to VIDEO OUT. 2) Play back the stairstep segment of MH-2 alignment tape. 3) Trigger the oscilloscope externally (– slope) with the signal from TP411. 4) Adjust R420 to position the trigger point 6.5 ± 0.5H from V. sync. 
2	SP slow tracking preset	Monitor-TV	Presetting unit (PTU 94008)	• SP mode • REC then PB (slow)	**Note:** *Set VCR to A mode by remote controller.* 1) Set recording video cassette into the cassette housing. 2) Receive a colour broadcast on a VHF-HI channel or supply a colour bar signal to VIDEO IN. 3) Record a colour broadcast or colour bar signal in the SP mode. 4) Play back recorded signal in the FWD and REV slow mode and set the tracking control of the FRONT panel to the center position by simultaneously pressing the (+) and (–) tracking buttons. 5) Observe the display on a monitor-TV and adjust for optimum noise condition (best tracking) by depressing "B (–)" or "C (+)" buttons of presetting unit as required. 6) Depress the STOP button on the FRONT panel. 7) Confirm that the bar noise is not visible on the monitor in the slow mode.
3	LP slow tracking preset	Monitor-TV	Presetting unit	• LP mode • Slow PB	1) In the same manner as the above SP slow mode.

2.5 VIDEO CIRCUIT

Note: *Unless otherwise specified, all test points and adjustments are located on the MAIN board.*

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	REC colour level and ch balance  Fig. 2-5-1 Component view of VIDEO UNIT board	L201-Ⓐ (VIDEO UNIT board)	R220 (SP Rec colour level) (Main board)	• PB mode • MH-2 colour bar • SP mode	1) Connect an oscilloscope to L201-Ⓐ (IC201-19) pin as shown in Fig. 2-5-1 and observe colour signal level. 2) Set the MH-2 alignment tape into the cassette housing, play back the colour bar segment of MH-2 alignment tape. 3) Set the tracking of the FRONT panel to the Auto tracking off position by simultaneously pressing the "+" and "−" tracking buttons. 4) Adjust by pressing the "+" and "−" tracking buttons of the Front panel for maximum level of the colour waveform and make a note of the higher colour level "A". 5) Press the STOP button on the FRONT panel and eject the MH-2 alignment tape.
	 Fig. 2-5-2 REC colour level			• REC then PB • MH-2 colour level • Auto tracking : OFF • SP mode	6) Set recording video cassette into the cassette housing. Supply a colour bar signal to VIDEO IN. 7) Trigger the oscilloscope externally with the signal from TP411 (DRUM FF) of the Main board. Use (−) trigger for CH1 and (+) trigger for CH2. 8) Record a colour bar signal in the SP mode. 9) Play back recorded colour bar signal. Set the tracking of the FRONT panel to the Auto tracking off position by simultaneously pressing the "+" and "−" tracking buttons and confirm 85 ± 5% of the noted colour level at L201-Ⓐ (IC201-19). If necessary, before recording, adjust R220 so that the higher level channel becomes 85 ± 5% of the noted level "A" during playback as shwon in Fig. 2-5-2. At this time, confirm that the channel level difference is within 3 dB. **Note:** ***Repeat the above step (9) several times.***
2	REC color level and CH balance	L201-Ⓐ (Video unit board)	R311 (LP Rec color level)	• LP mode	1) In the same manner as the above SP mode. 2) Short TP404 to ground, adjust R311 for LP REC color level.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
3	YNR NC balance	TP21 (IC1-26) (VIDEO UNIT board)	R16 (NC BAL) (VIDEO UNIT board)	• E-E • INPUT SEL: AUX • Colour bar • SP mode	1) Supply a colour bar signal to VIDEO IN and connect an oscilloscope to TP21 (IC1-26 pin). 2) Adjust R16 for minimum DC step difference.
	 Fig. 2-5-3				
4	SP PB Frequency	VIDEO OUT (TP201)	R226 (PB EQ)	• REC then PB • Video sweep • Auto tracking off	1) Terminate VIDEO OUT with monitor - TV (75 Ω load), supply a video sweep signal without burst to VIDEO IN. 2) Set recording video cassette into the cassette housing. Record a video sweep signal without burst in the SP mode. 3) Connect an oscilloscope to VIDEO OUT. Play back recorded video sweep signal in the SP mode, set the tracking of the Front panel to the Auto tracking off position by simultaneously pressing the (+) and (–) tracking buttons. 4) Use the control of the oscilloscope to position the 100 kHz region at graduation 3 (0 dB) of the oscilloscope scale. 5) Adjust R226 to position the 2 MHz of channel-1 portion at 2.4 – 3.0 (–1 ± 1 dB) of the oscilloscope graduations as shown in Fig. 2-5-4. At this time, confirm that the channel difference is within 2 dB.
	 3 scale 2.4-3 scale 100 kHz 1 MHz 2 MHz T : 2 ms/10 mV Fig. 2-5-4 PB frequency				
			R226	• REC then PB • TV broadcast • Auto tracking off	**Alternate method** 1) Set recording video cassette into the cassette housing, receive a colour broadcast on a VHF channel. 2) Record a colour broadcast that shows a good depiction of human facial contours. 3) Play back recorded colour broadcast, set the tracking of the Front panel to the Auto tracking off position by simultaneously pressing the (+) and (–) tracking buttons. 4) Adjust R226 to obtain distinct facial features on the monitor. **Note:** ***R226 nearly at centre position.***

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
5	LP PB Frequency	VIDEO OUT TP201	R313 (PB EQ)	• REC then PB • Video sweep • Audio tracking off	1) In the same menner as the SP PB frequency. 2) Adjust R313 to position the 2 MHz of channel-1 portion at 1.5 – 1.7 (–5 ± 1 dB) of the oscilloscope graduations as shown in Fig. 2-5-4.
6	Faber timing  CH-1 TP210 SYNC 1/2 1/2 T CH-2 TP251 1/2 1/2 Fig. 2-5-5	TP210 TP251	R385 (Fader timing)	• REC SP mode • Color bar	1) Connect one channel of a dual trace oscilloscope to TP210 and the other channel to TP251. 2) Set the oscilloscope for CHIP mode. 3) Use the controls of the oscilloscope to expand portion H sync. 4) Adjust R385 for 6.5 ± 0.5 μsec of "T" as shown in Fig. 2-5-5.
7	SECAM DET.	IC251-18 (VIDEO UNIT board)	LC251 (VIDEO UNIT board)	• E-E • SECAM color bar	1) Connect an oscilloscope to pin 18 of IC251. 2) Adjust LC251 so that A and B are relted as follows: A : B = 3 : 4 = 0.84 Vp-p : 1.11 Vp-p  Fig. 2-5-6

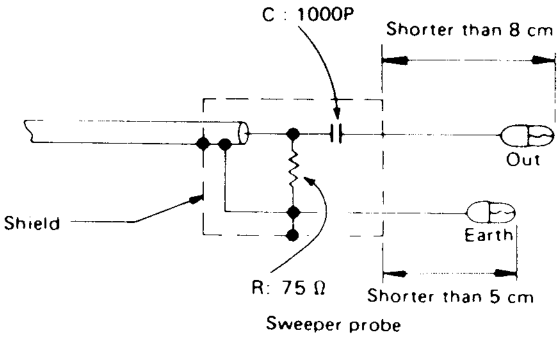
2.6 AUDIO CIRCUIT

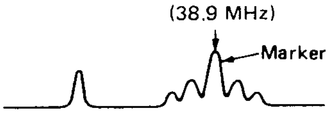
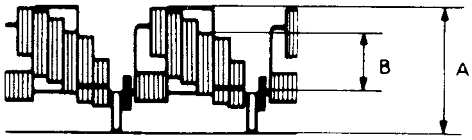
Notes: *1. Unless otherwise specified, all test points and adjustments are located on the AUDIO board.*
2. Set the AUDIO LIMITER SW to ON position to obtain −6 dBs±0.5 dBs at AUDIO OUT.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	Audio Bias Level	TP31 (+) TP32 (−)	R9	SOURCE Select: AUX SP mode REC mode No signal	1) Connect a millivoltmeter between TP31 and TP32. 2) Set for REC mode without incoming signal. 3) Adjust R9 for 1.9 mVrms.
2	E-E level	AUDIO OUT	R40 (CH1/L)	SOURCE Select: AUX Limiter SW to OFF (AUS) AUDIO OUT to Hi-Fi	1) Set the SOURCE SELECT switch to the AUX position. Supply a 1 kHz, −8 dBs audio signal via A/V conn. (Both channel). 2) Set Hi-Fi REC controls to center position. In the STOP (E-E) mode, adjust R40 to obtain −6 ± 0.5 dBs at AUDIO OUT.
			R41 (CH2/R)	E-E	3) In the same manner, adjust R41 for the R (CH2) channel.
3	Level indicator	FDP (Level ind.)	R73 (Indicator CH1/L)	AUX AUDIO OUT to Hi-Fi Limitor SW to OFF (AUS)	Note: *Perform the level indicator adjustment after completing the E-E level adjustment (section 2.6, No. 2)* 1) Set the SOURCE SELECT switch to the AUX position. Supply a 1 kHz, −8 dBs audio signal via A/V CONN. (both channels) 2) Set Hi-Fi REC controls to controls to center position. In the E-E (STOP) mode, adjust R73 to where the FDP level indicators show 0 dB (all white LEDs light).
			R74 (Indicator CH2/R)		3) In the same manner, adjust R74 for the R (CH2) channel).

2.7 TUNER/IF CIRCUIT

Note: *Unless otherwise specified, all test points and adjustments are located on the TUNER/IF board.*

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
Equipment required: 1. Oscilloscope 2. IF sweep signal genrator with suitable markers (PIF, etc.) 3. Sweeper probe (sweep signal supply cable) as shown below.					 C : 1000P Shorter than 8 cm Out Shield Earth R: 75 Ω Shorter than 5 cm Sweeper probe Fig. 2-7-1

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	VCO	IC1-28	T2 (VCO)	• Sweep genrator out: 70 dBμ (38.9 MHz) • Tuner mode without antenna IN	1) Use a sweeper probe as shown in Fig. 2-7-1 and connect the sweep generator output to pin 1 of SAW 1. Adjust the sweep gain so that the waveform does not distort as observed with the oscilloscope. Connect the oscilloscope to pin 28 of IC1 (VIDEO DET OUT) and adjust T2 to align the waveform with the frequency marker as shown in Fig. 2-7-2.
		 VCO and sweep signal (beat) **Fig. 2-7-2**		• TV broadcast • Tuner mode	**Alternate method:** 1) Receive a colour broadcast on a VHF-HI channel. 2) Adjust T2 to obtain a fine picture on the monitor.
	• Before the following adjustments: 1. Connect a cable to ANT IN and terminate TV OUT at 75 Ω. 2. Set a TV channel signal generator as follows. Video : 65 dBμ/75 Ω, colour bar 87.5% modulation Audio : 55 dBμ/75 Ω, 1 kHz ± 50 kHz deviation				
2	RF AGC	IF terminal of Front end	R21	• TV signal • Tuner mode	1) Connect the oscilloscope to IF terminal of U/V Tuner (Front end). Adjust R21 for maximum level, then again adjust R21 for –8 dB again.
		MONITOR	R21	• TV broadcast • Tuner mode	**Alternate method:** Note: *Adjust R21 (RF AGC) to correct for excess noise in the picture or when streaky cross interference occurs due to strong electrical fields.* 1) Adjust R21 to minimize noise or streaks on the TV screen. 2) Check for absence of abnormality on all channels.
3	Colour Level	CN1-4 (VIDEO OUT) TUNER CTL board	R40	• TV signal • Tuner mode • Colour bar	1) Receive a colour bar signal. Set the Y level for 100% reference signal and then adjust R40 for a magenta level of 48% at pin 4 of CN1.
		 B: magenta A:B = 1:0.48 **Fig. 2-7-3**		• TV broadcast • Tuner mode	**Alternate method:** 1) Receive a colour broadcast on a VHF-HI channel 2) Adjust R40 so that the magenta level becomes 2/3% of the sync. level.
4	Sync det	Across C33	T5 (Sync det)	• TV broadcast • Tuner mode	1) Receive a colour broadcast on a VHF-HI channel. Connect oscilloscope across C33. 2) Set the oscilloscope to DC mode Adjust T5 to obtain maximum level.

2.8 ON SCREEN CIRCUIT

Note: *Unless otherwise specified, all test points and adjustments are located on the MAIN board.*

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	Charactor position	TP901	C905	• E-E mode	1) Connect a frequency counter to TP901 and GND. 2) Short IC901-3 pin to GND. 3) Adjust C905 for 7.30 ± 0.05 MHz. **Note:** *If incorrectly the above adjustment, slip out the on screen display.* *For adjustment of above steps (2) to (4), looking for Menu on the monitor-TV and rough adjustment C905 preparation.*
2	Back ground colour	TP902	C916	• E-E mode	1) Connect a frequency counter to TP902 and GND. 2) Adjust C916 for 17.73447 ± 0.00030 MHz. **Note:** *If incorrectly the above adjuatment, blue back picture is not appear on the monitor-TV.* *For adjustment of above steps (1) to (2), looking for Menu on the monitor-TV and rough adjustment C916 preparation.*

2.9 DEMODULATOR CIRCUIT

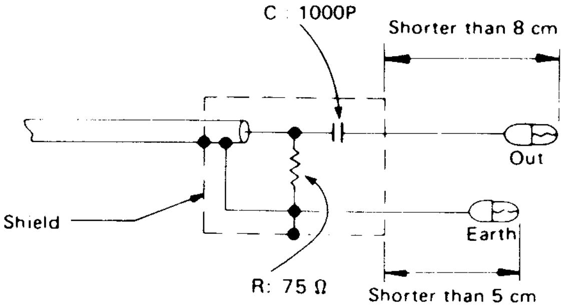
Note: *Unless otherwise noted, all test points and adjustments are located on the DEMODULATOR board.*

Audio Multiplex TV Signal Generator

Recommended Specifications

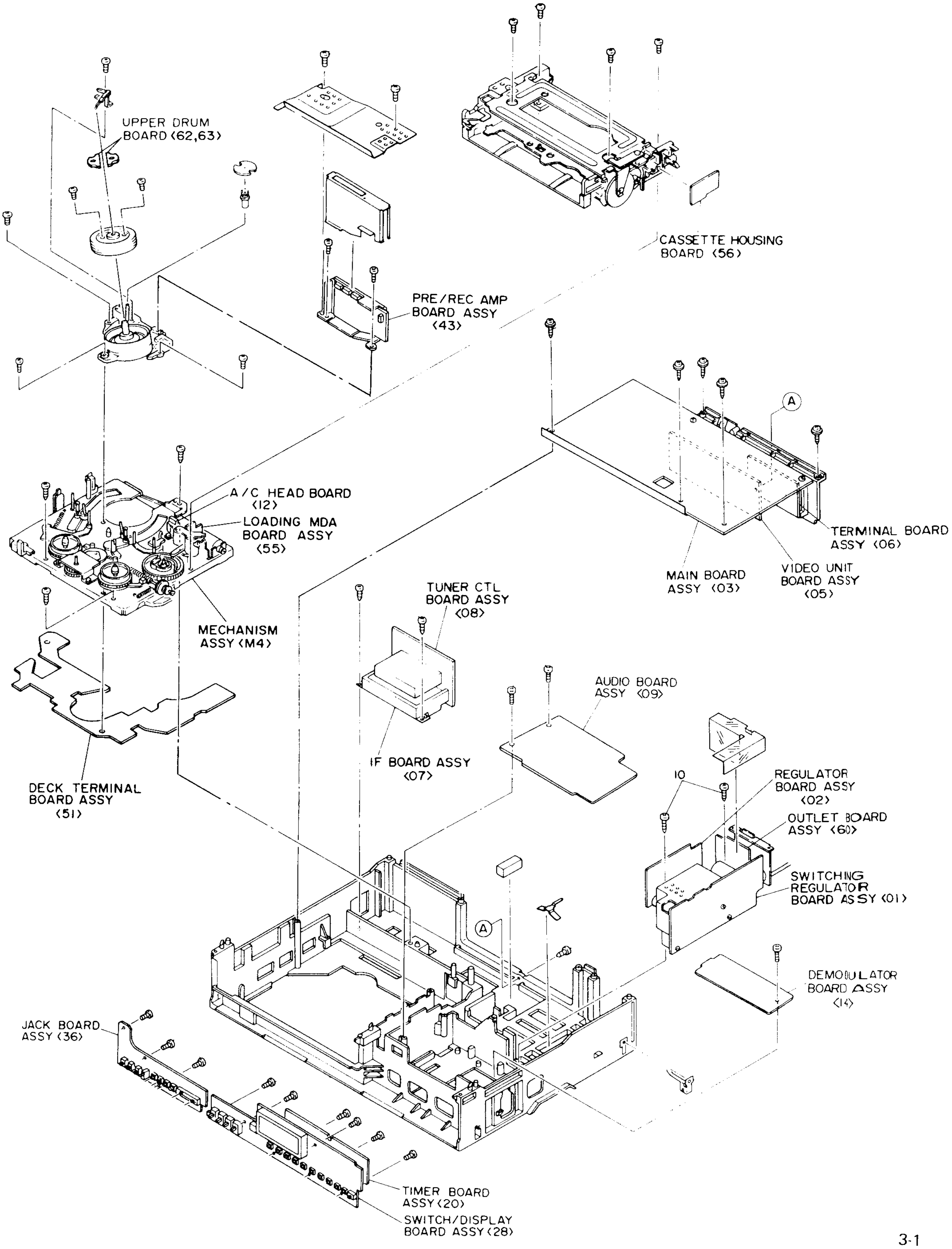
1. Signal Format	Based on CCIR-B
2. Frequency	
Video Carrier Fv	38.9 MHz
1st Sound Carrier fs_1	33.4 MHz
2nd Sound Carrier fs_2	33.1578125 MHz
3. Modulator	
Video	Crosshatch (black on white) V: 50 Hz, H: 15.625 kHz
Audio	Sinewave 1 kHz; CH1 and CH-2 outputs switchable
4. Output	97 dB/μV (open) ± 2 dB fixed, BNC-R 75 Ω
5. P-S Ratio	S_1 P − 13 dB ± 2 fixed S_2 P − 20 dB ± 2 fixed
6. Modulation	
Video	87.5% ± 3%
Audio	±30 kHz ± 2 kHz
7. Stereo Separation	Less than −40 dB
8. Pilot Signal	
Carrier Frequency	54.6875 kHz ± 5 Hz synchronized type
Stereo	117.5 Hz AM 50%
Dual	274.1 Hz AM 50%

9. Sound Modulation Modes	S_1	S_2
Mono	Mono 1	Mono 2
Stereo	(L + R)/2	R
Dual	Mono 1	Mono 2
10. Functions	S_1	S_2
Mono (M)	100%	100%
Stereo (L, R)	(L + R)/2	R
(L)	L/2	–
(R)	R/2	R
(OFF)	–	–
Mult (S_1, S_2)	100%	100%
(S_1)	100%	0
(S_2)	0	100%
(OFF)	0	0
V. MOD (ON/OFF)		
11. Frequency Accuracy	Within $\pm 5 \times 10^{-5}$	
12. Spurious	Less than −50 dB	
13. Saw Filter	Self-contained	

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
	• **Equipment required:** 1. Oscilloscope 2. Audio Multiplex TV Signal Generator 3. Sweeper probe (sweep signal supply cable) as showm below.				 C : 1000P Shorter than 8 cm Out Shield Earth R: 75 Ω Shorter than 5 cm Sweeper probe **Fig. 2-9-1**
1	First audio detector coil	IC1 pin 3	T4 [IF PWB]	•BILING mode •SUB: unmod. •MAIN: mod.	1) Apply Main audio modulated signal to the front end IF terminal. 2) Connect a distortion meter to IC1 pin 3. 3) Adjust T4 of the IF baord for minimum distortion. **Note:** *Audio multiplex TV signal generator connection is the same for the following adjustments.*
2	Second audio detector coil	IC1 pin 2	T1	• BILING mode • SUB: mod. • MAIN: unmod.	1) Connect a distortion meter to IC1 pin 2. 2) Adjust T1 of the IF board for minimum distortion.
3	Stereo separation	IC1 pin 5	R2	• STEREO mode • R : mod. • L : unmod.	1) Set a signal generator to Stereo mode, but adjust only the R channel. 2) Connect an oscilloscope to IC1 pin 5. 3) Adjust R2 for minimum output level.
4	Buzz	CN2 pin 2	T8, T2 [IF PWB]	• STEREO mode • R/L : unmod.	1) Connect a noise meter to CN2 pin 2 and an oscilloscope to AC output of the noise meter. 2) Adjust T8 of the IF board for minimum Philips pattern noise. 3) Adjust T2 of the IF board for minimum crosshatch noise.
5	Audio output level	CN2 pin 2 (L) CN2 pin 4 (R)	R21 (L) R24 (R)	• STEREO mode • R: mod./unmod. • L: unmod./mod.	1) Set a signal generator for Stereo mode. 2) Connect an audio meter to CN2 pin 2. 3) Adjust R21 (L channel) for –18.0 ± 0.5 dBs. 4) Similarly, connect an audio meter to pin 4 of CN2 and adjust R24 for the R channel.

SECTION 3
CHARTS AND DIAGRAMS

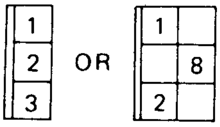
3.1 CIRCUIT BOARD AND LOCATION


UPPER DRUM BOARD ‹62,63›
CASSETTE HOUSING BOARD ‹56›
PRE/REC AMP BOARD ASSY ‹43›
Ⓐ
A/C HEAD BOARD ‹12›
LOADING MDA BOARD ASSY ‹55›
TERMINAL BOARD ASSY ‹06›
MAIN BOARD ASSY ‹03›
VIDEO UNIT BOARD ASSY ‹05›
TUNER CTL BOARD ASSY ‹08›
MECHANISM ASSY ‹M4›
AUDIO BOARD ASSY ‹09›
IF BOARD ASSY ‹07›
DECK TERMINAL BOARD ASSY ‹51›
10
REGULATOR BOARD ASSY ‹02›
OUTLET BOARD ASSY ‹60›
SWITCHING REGULATOR BOARD ASSY ‹01›
Ⓐ
DEMODULATOR BOARD ASSY ‹14›
JACK BOARD ASSY ‹36›
TIMER BOARD ASSY ‹20›
SWITCH/DISPLAY BOARD ASSY ‹28›

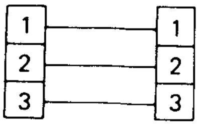
3.2 GENERAL INFORMATION

3.2.1 Connections

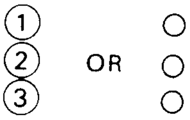
Note:
Unless otherwise specified, only signal input flow is indicated.
Connection arrows indicate only signal outputs.



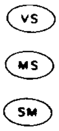
: Connectors



: Board in connectors



: Direct connections



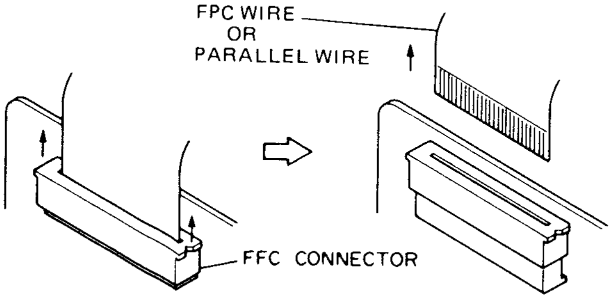
: Connected pattern in the board.
Abbreviations

V :	Video	M :	Mechacon
S :	Servo	A :	Audio

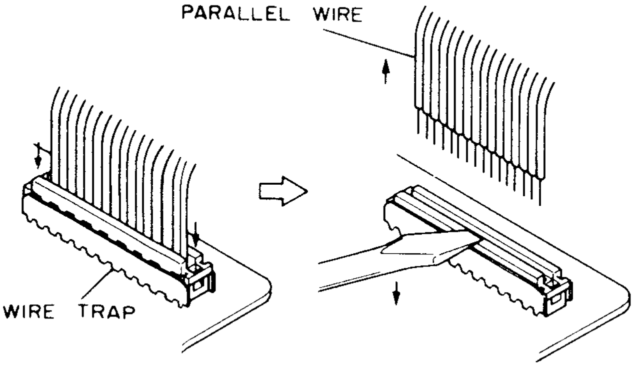
VS : Signal flow from video to servo.

3.2.2 Disconnecting the flatwire

1. Pull the connector structure upward to release the clamp when removing or inserting the flat wire cable.

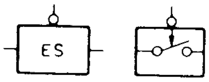


2. Depress the connector structure downward to release the clamp when removing or inserting the flat wire cable, as indicated below.

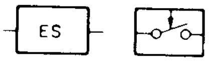


3.2.3 Indications

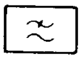
AUX : Active only at high.
$\overline{AUX}$: Active only at low.
$\bar{A}\bar{U}\bar{X}$: Active only at middle.
$\bar{A}U\bar{X}$: Active only at open.



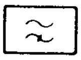
: Active only at low for electronic switch.



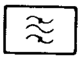
: Active only at high for electronic switch.



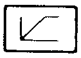
: Low pass filter.



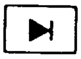
: High pass filter.



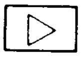
: Band pass filter.



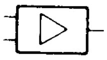
: Limiter.



: Detector



: Amplifier.



: Mixer stage.

3.2.4 Schematic diagram values

Unless otherwise specified.

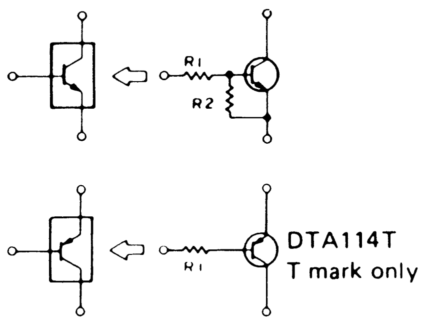
1. All resistance values are in ohms, 1/6 W, 1/8 W, (refer to parts list).
2. All capacitance values are in μF, (P; PF).
3. All inductance values are in μH, (m; mH).
4. All diodes are 1SS133 or MA165, (refer to parts list).
5. Voltages are DC-measured (reference to ground) with a digital voltmeter during recording (SP mode) and playback (SP mode) with alignment tape. Where voltages differ between recording and playback, the voltage during playback is shown in parentheses.
6. Waveforms (VIDEO System) are measured (reference to ground) with a color bar during recording (SP mode) and playback (SP mode) with alignment tape.
7. Waveforms (AUDIO System) are measured (reference to ground) with 1 kHz (−8 dBs) during recording and playback with alignment tape (1 kHz).
8. Shaded (   ) parts are critical for safety.
   Replace only with specified parts numbers.

3.2.5 Signal flow in the schematic

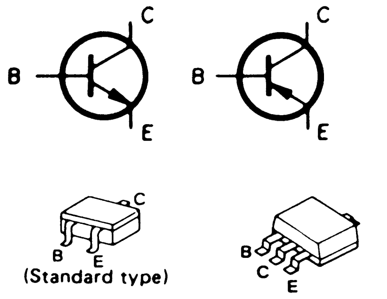
➡ Recording signal path
⇨ Playback signal path
⇨ REC/PB signal path

3.2.6 Semiconductors

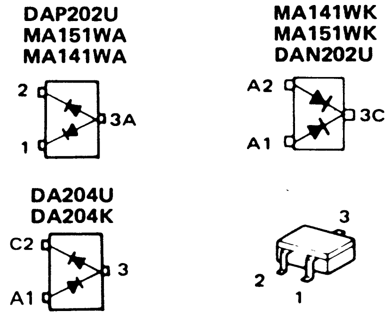
1. Digital transistor


R1
R2
DTA114T
T mark only
R1

2. Chip transistor


C
B
E
C
B
E
C
B E
(Standard type)
B
C
E

3. Chip diode


DAP202U
MA151WA
MA141WA
2
1
3A
MA141WK
MA151WK
DAN202U
A2
A1
3C
DA204U
DA204K
C2
A1
3
3
2
1

Note:
The digital transistor includes built in resistors.
It features small size and high reliability.
Both PNP and NPN types are available.

Uses:
Inverter, Interface, driver circuits.

3.2.7 Replacement of chip parts

For replacing chip parts, proceed it as follows.
Use a well insulated fine-tipped soldering iron (approx. 17 W, 130°C ~ 260°C in temp.).
In addition, it is recommended to use a soldering iron (55 W approx.) with solder absorber for convenience.

Caution:
- Do not apply heat for more than 3 seconds.
- Do not rub electrodes.
- Do not reuse chips removed once. Discard them.
- Supplementary cementing is not required.

1. Soldered condition of chip parts

- Resistors, capacitors, etc.

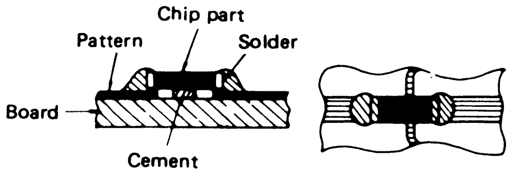

Chip part
Pattern
Solder
Board
Cement

Fig. 3-2-1 Soldering condition-1

- Transistors, diodes, etc.

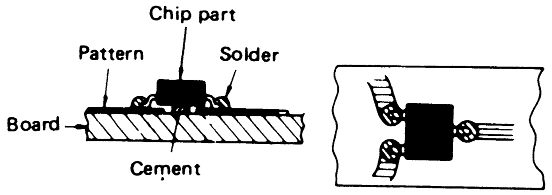

Chip part
Pattern
Solder
Board
Cement

Fig. 3-2-2 Soldering condition-2

2. How to remove chip parts

- Resistors, capacitors, etc.

1) Set a chip parts replacing tool onto the chip parts to hold it down.
2) Unsolder at a side of the chip parts.

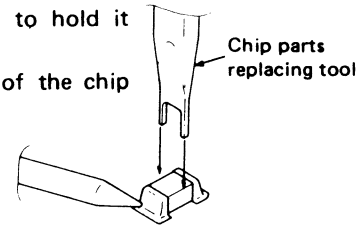

Chip parts replacing tool

Fig. 3-2-3 R/C removal-1

3) Remove the chip parts by twisting and sliding it.

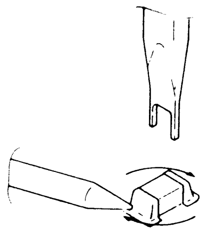


Fig. 3-2-4 R/C removal-2

3. How to remove transistors, diode.

1) Unsolder at the one-lead side of the chip parts.

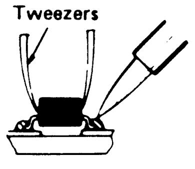


Fig. 3-2-5 Tr/Diode removal-1

2) Lift the unsoldered side upwards.

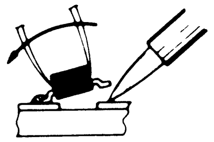


Fig. 3-2-6 Tr/Diode removal-2

3) Heat the other two leads simultaneously and remove the chip parts upwards.

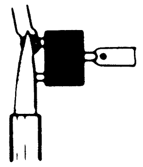


Fig. 3-2-7 Tr/Diode removal-3

4. Preheating and soldering

When setting new chip parts, especially capacitors, but except transistors, preheat them with hot air (150°C approx.) by use of a blower type of hair dryer for about 2 minutes just before soldering. For soldering, use a soldering iron of 30 watt approximately.

5. How to set and solder chip parts

1) Presolder the contact points of the circuit pattern to which the chip parts will be soldered.

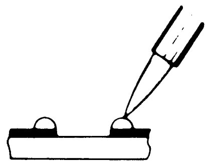


Fig. 3-2-8 Soldering-1

2) Holding down the chip parts with the chip parts replacing tool, solder it with a soldering iron.

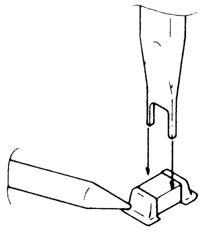
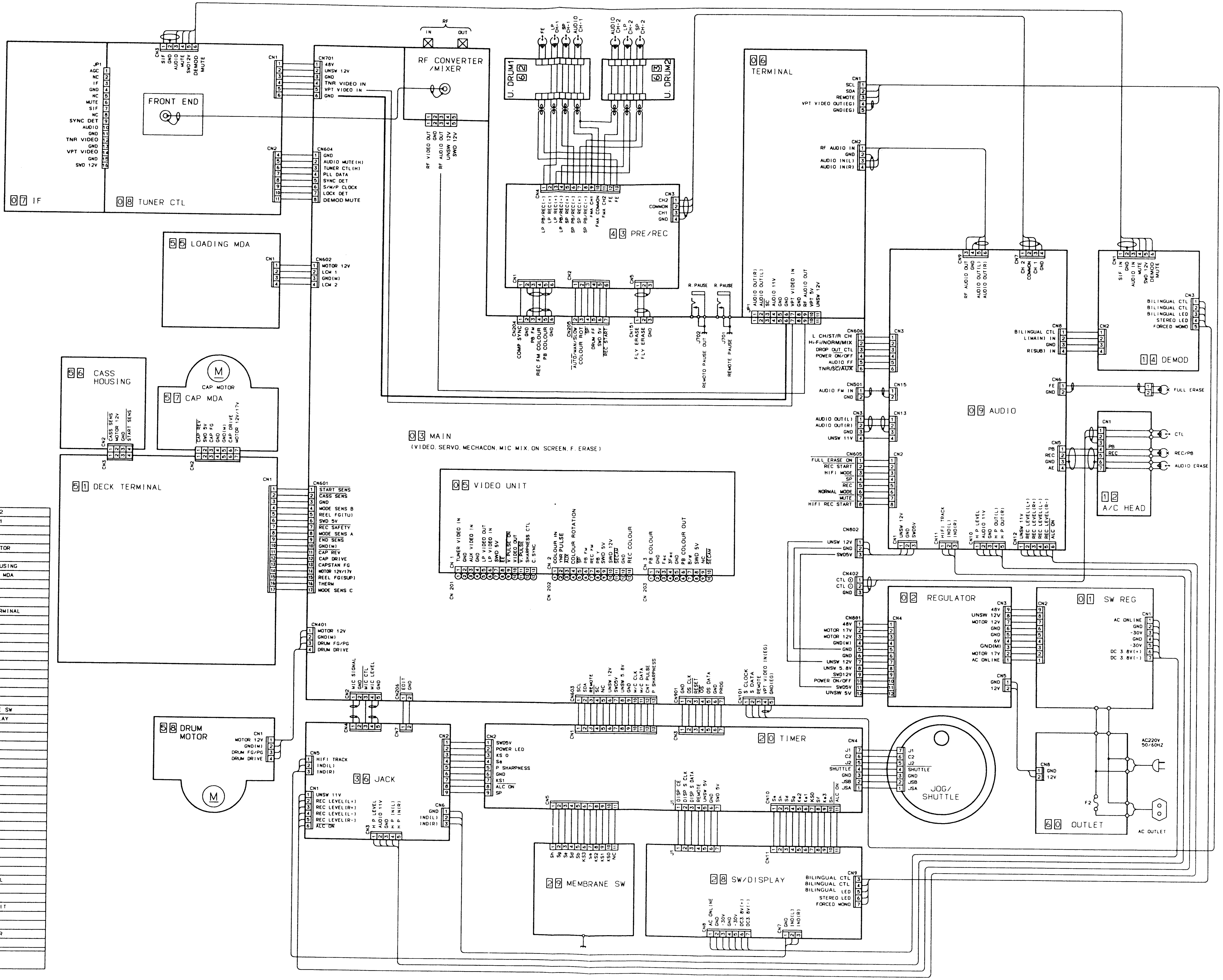


Fig. 3-2-9 Soldering-2

3.3 BOARD INTERCONNECTIONS

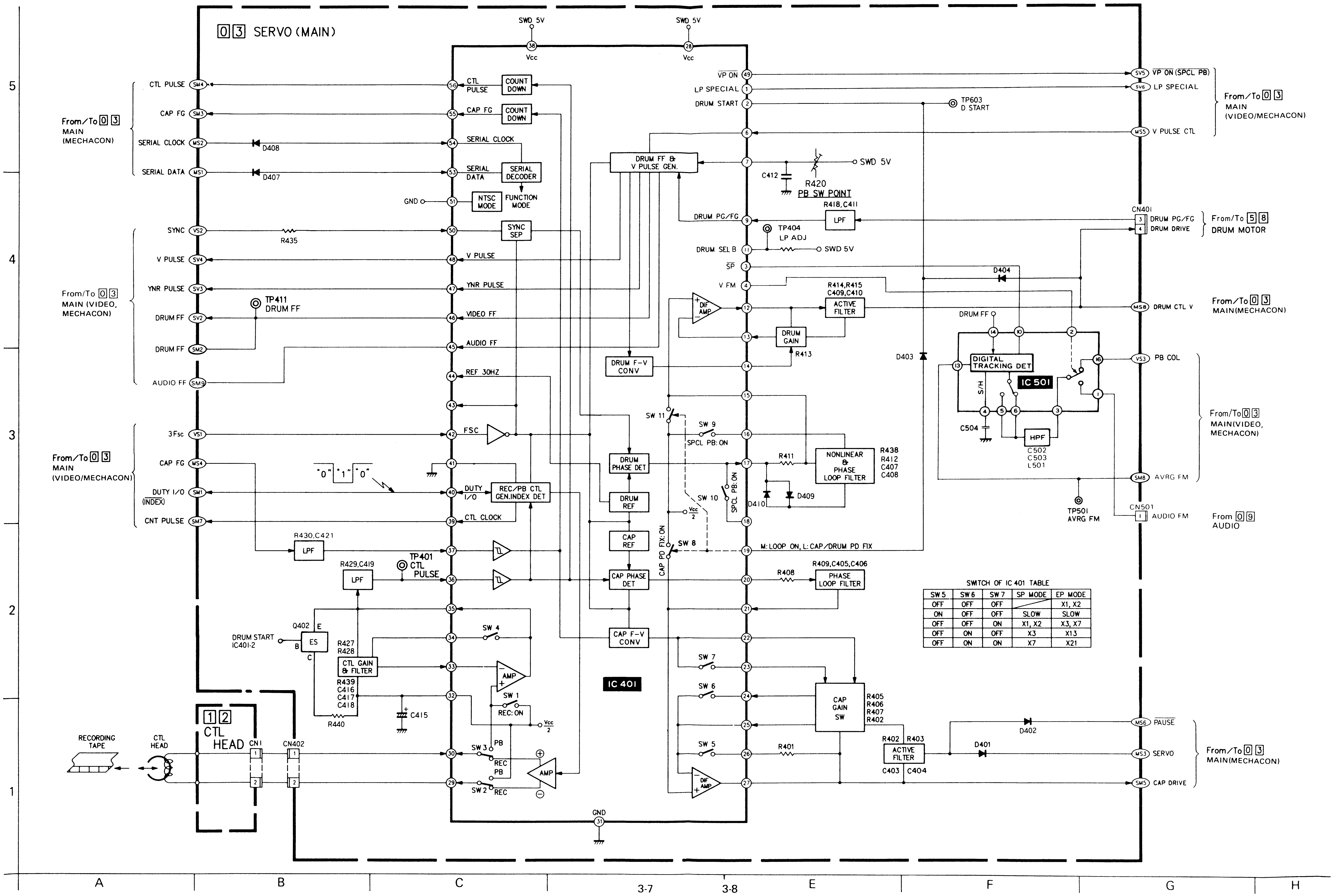

RF
IN
OUT
RF CONVERTER /MIXER
FRONT END
07 IF
08 TUNER CTL
55 LOADING MDA
56 CASS HOUSING
57 CAP MDA
CAP MOTOR
M
51 DECK TERMINAL
58 DRUM MOTOR
M
62 U. DRUM1
63 U. DRUM2
43 PRE/REC
06 TERMINAL
03 MAIN
(VIDEO, SERVO, MECHACON, MIC MIX, ON SCREEN, F. ERASE)
05 VIDEO UNIT
09 AUDIO
14 DEMOD
12 A/C HEAD
02 REGULATOR
01 SW REG
60 OUTLET
36 JACK
20 TIMER
29 MEMBRANE SW
28 SW/DISPLAY
JOG/ SHUTTLE
FULL ERASE
CTL
REC/PB
AUDIO ERASE
AC220V 50/60HZ
AC OUTLET
R. PAUSE
R. PAUSE
CN701
CN604
CN602
CN601
CN401
CN606
CN501
CN3
CN605
CN802
CN402
CN881
CN603
CN901
CN101
CN204
CN205
CN15
J702
J701

N O	NAME
6 3	U. DRUM 2
6 2	U. DRUM 1
6 0	OUTLET
5 8	DRUM MOTOR
5 7	CAP MDA
5 6	CASS HOUSING
5 5	LOADING MDA
5 4	
5 3	
5 2	
5 1	DECK TERMINAL
5 0	
4 3	PRE/REC
3 6	JACK
2 9	MEMBRANE SW
2 8	SW/DISPLAY
2 1	
2 0	TIMER
1 9	
1 8	
1 7	
1 6	
1 5	
1 4	DEMOD
1 3	
1 2	A/C HEAD
1 1	
1 0	
0 9	AUDIO
0 8	TUNER CTL
0 7	IF
0 6	TERMINAL
0 5	VIDEO UNIT
0 4	
0 3	MAIN
0 2	REGULATOR
0 1	SW. REG.

5
4
3
2
1

A B C D E F G H

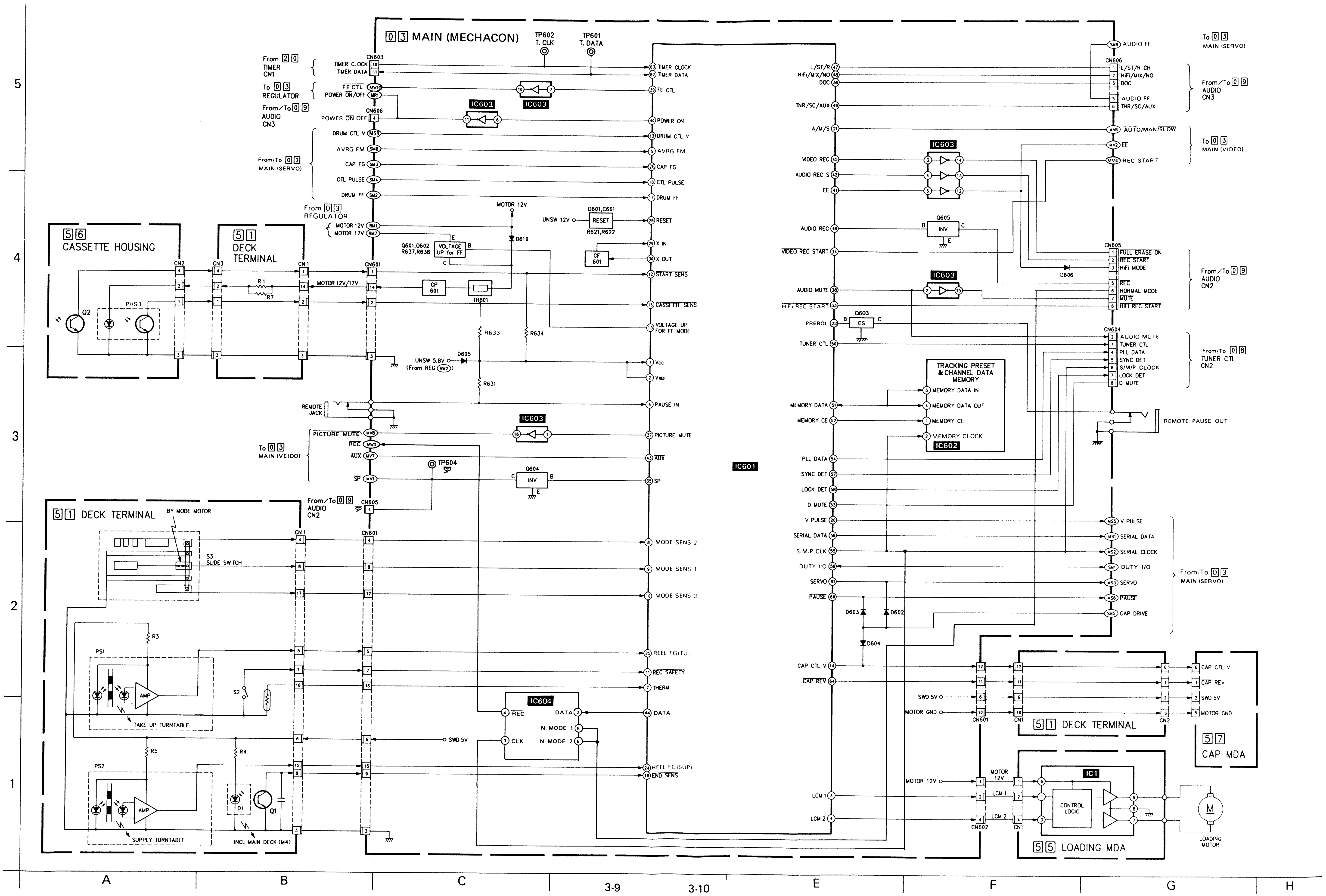
3.4 SERVO BLOCK DIAGRAM


03 SERVO (MAIN)
SWD 5V
Vcc
IC 401
IC 501
12 CTL HEAD
RECORDING TAPE
CTL HEAD
CN1
CN402
From/To 03 MAIN (MECHACON)
CTL PULSE
CAP FG
SERIAL CLOCK
SERIAL DATA
D408
D407
COUNT DOWN
SERIAL DECODER
FUNCTION MODE
NTSC MODE
GND
From/To 03 MAIN (VIDEO, MECHACON)
SYNC
V PULSE
YNR PULSE
DRUM FF
AUDIO FF
R435
TP411 DRUM FF
SYNC SEP
VIDEO FF
REF 30HZ
From/To 03 MAIN (VIDEO/MECHACON)
3Fsc
CAP FG
DUTY I/O (INDEX)
CNT PULSE
FSC
DUTY I/O
CTL CLOCK
REC/PB CTL GEN.INDEX DET
"0" "1" "0"
R430,C421
LPF
R429,C419
TP401 CTL PULSE
DRUM START IC401-2
Q402
ES
R427 R428
CTL GAIN & FILTER
R439 C416 C417 C418
R440
C415
AMP
SW 1 REC:ON
SW 2 REC
SW 3 PB
SW 4
REC PB
Vcc/2
GND
DRUM FF & V PULSE GEN.
DRUM F-V CONV
DRUM PHASE DET
DRUM REF
CAP REF
CAP PHASE DET
CAP F-V CONV
VP ON
LP SPECIAL
DRUM START
TP603 D START
C412
R420 PB SW POINT
SWD 5V
DRUM PG/FG
R418,C411
LPF
TP404 LP ADJ
DRUM SEL B
SP
V FM
DIF AMP
R414,R415 C409,C410
ACTIVE FILTER
DRUM GAIN
R413
D404
D403
SW 11
SW 9 SPCL PB:ON
SW 10 SPCL PB:ON
R411
NONLINEAR & PHASE LOOP FILTER
R438 R412 C407 C408
D410
D409
SW 8 CAP PD FIX:ON
M:LOOP ON, L:CAP/DRUM PD FIX
R408
R409,C405,C406
PHASE LOOP FILTER
SW 7
SW 6
SW 5
CAP GAIN SW
R405 R406 R407 R402
R401
R402 R403
ACTIVE FILTER
C403 C404
D401
D402
DRUM FF
DIGITAL TRACKING DET
S/H
C504
HPF
C502 C503 L501
TP501 AVRG FM
VP ON (SPCL PB)
LP SPECIAL
V PULSE CTL
From/To 03 MAIN (VIDEO/MECHACON)
CN401
DRUM PG/FG
DRUM DRIVE
From/To 58 DRUM MOTOR
DRUM CTL V
From/To 03 MAIN(MECHACON)
PB COL
AVRG FM
From/To 03 MAIN(VIDEO, MECHACON)
CN501
AUDIO FM
From 09 AUDIO
PAUSE
SERVO
CAP DRIVE
From/To 03 MAIN(MECHACON)
1
2
3
4
5
A
B
C
E
F
G
H

SWITCH OF IC 401 TABLE

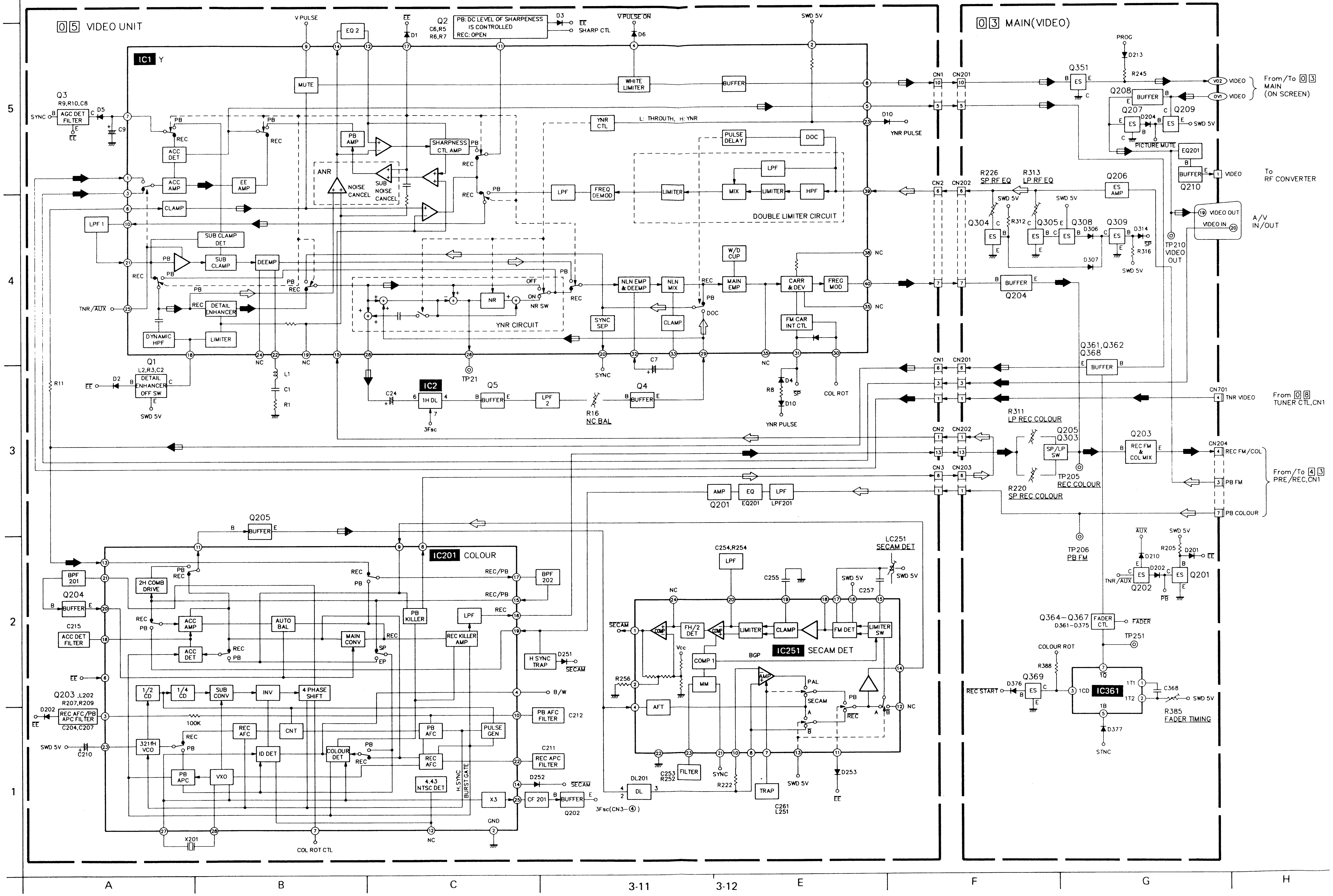
SW 5	SW 6	SW 7	SP MODE	EP MODE
OFF	OFF	OFF		X1, X2
ON	OFF	OFF	SLOW	SLOW
OFF	OFF	ON	X1, X2	X3, X7
OFF	ON	OFF	X3	X13
OFF	ON	ON	X7	X21

3.5 SYSTEM CTL BLOCK DIAGRAM



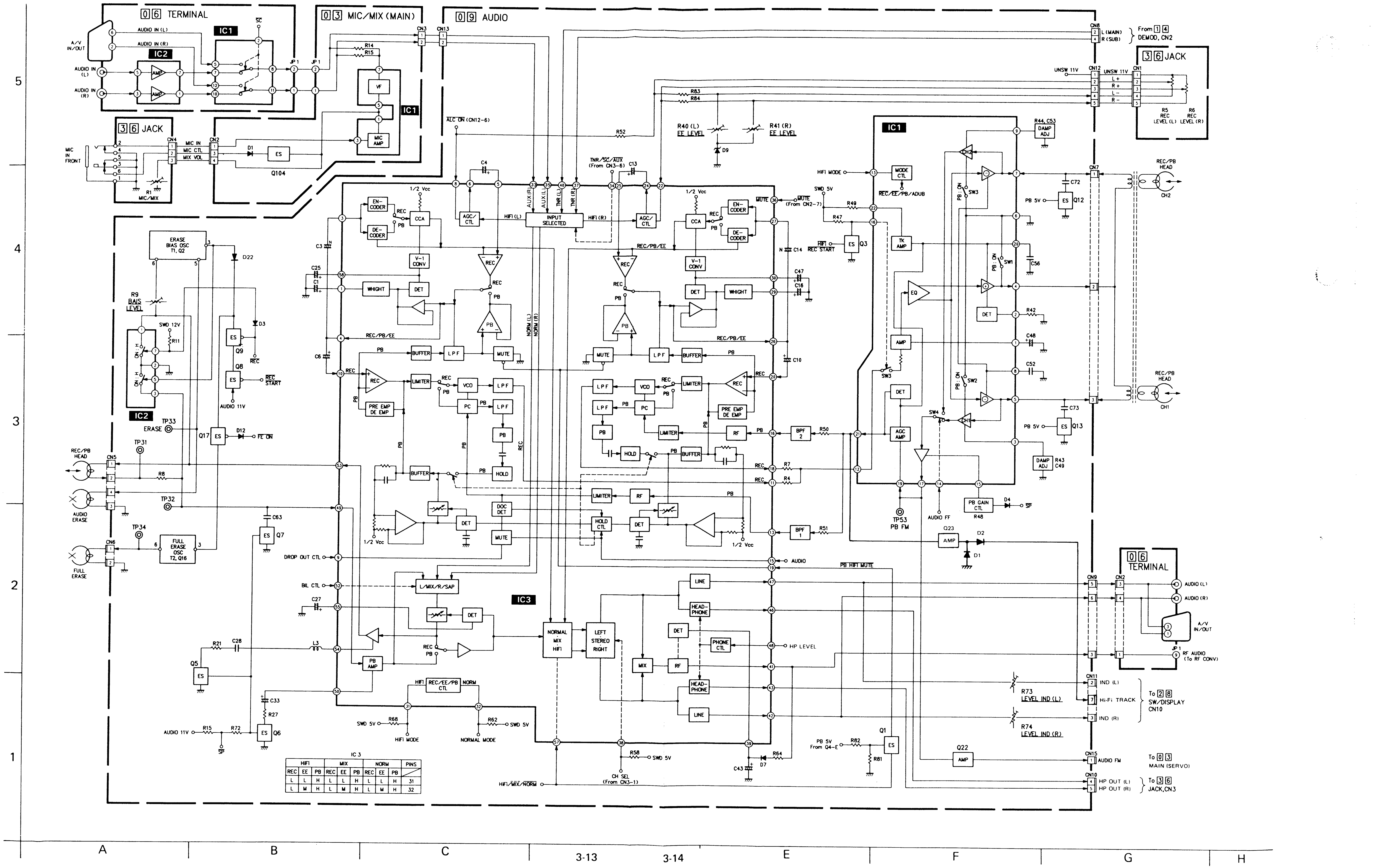
03 MAIN (MECHACON)
TP602 T. CLK
TP601 T. DATA
From 20 TIMER CN1
TIMER CLOCK
TIMER DATA
To 03 REGULATOR
FE CTL
POWER ON/OFF
From/To 09 AUDIO CN3
CN603
CN606
POWER ON OFF
From/To 03 MAIN (SERVO)
DRUM CTL V
AVRG FM
CAP FG
CTL PULSE
DRUM FF
From 03 REGULATOR
MOTOR 12V
MOTOR 17V
MOTOR 12V
D610
Q601,Q602 R637,R638
VOLTAGE UP for FF
D601,C601
UNSW 12V
RESET
R621,R622
CF 601
IC603
TIMER CLOCK
TIMER DATA
FE CTL
POWER ON
DRUM CTL V
AVRG FM
CAP FG
CTL PULSE
DRUM FF
RESET
X IN
X OUT
START SENS
CASSETTE SENS
VOLTAGE UP FOR FF MODE
Vcc
VREF
PAUSE IN
PICTURE MUTE
AUX
SP
MODE SENS 2
MODE SENS 1
MODE SENS 3
REEL FG(TU)
REC SAFETY
THERM
DATA
REEL FG(SUP)
END SENS
56 CASSETTE HOUSING
Q2
PHS3
51 DECK TERMINAL
CN2
CN3
CN1
CN601
R1
R7
MOTOR 12V/17V
CP 601
TH601
R633
R634
R631
D605
UNSW 5.8V (From REG RM2)
REMOTE JACK
To 03 MAIN (VEIDO)
PICTURE MUTE
REC
AUX
SP
TP604 SP
Q604 INV
From/To 09 AUDIO CN2
CN605
51 DECK TERMINAL
BY MODE MOTOR
S3 SLIDE SWITCH
R3
PS1
AMP
S2
TAKE UP TURNTABLE
R5
R4
PS2
D1
Q1
SUPPLY TURNTABLE
INCL MAIN DECK (M4)
SWD 5V
IC604
REC
DATA
N MODE 1
N MODE 2
CLK
IC601
L/ST/R
HiFi/MIX/NO
DOC
TNR/SC/AUX
A/M/S
VIDEO REC
AUDIO REC S
EE
AUDIO REC
VIDEO REC START
AUDIO MUTE
HiFi REC START
PREROL
TUNER CTL
MEMORY DATA
MEMORY CE
PLL DATA
SYNC DET
LOCK DET
D MUTE
V PULSE
SERIAL DATA
S/M/P CLK
DUTY I/O
SERVO
PAUSE
CAP CTL V
CAP REV
LCM 1
LCM 2
Q605 INV
Q603 ES
D603
D602
D604
D606
TRACKING PRESET & CHANNEL DATA MEMORY
MEMORY DATA IN
MEMORY DATA OUT
MEMORY CE
MEMORY CLOCK
IC602
AUDIO FF
CN606
L/ST/R CH
HiFi/MIX/NO
DOC
AUDIO FF
TNR/SC/AUX
To 03 MAIN (SERVO)
From/To 09 AUDIO CN3
AUTO/MAN/SLOW
EE
REC START
To 03 MAIN (VIDEO)
CN605
FULL ERASE ON
REC START
HiFi MODE
REC
NORMAL MODE
MUTE
HiFi REC START
From/To 09 AUDIO CN2
CN604
AUDIO MUTE
TUNER CTL
PLL DATA
SYNC DET
S/M/P CLOCK
LOCK DET
D MUTE
From/To 08 TUNER CTL CN2
REMOTE PAUSE OUT
V PULSE
SERIAL DATA
SERIAL CLOCK
DUTY I/O
SERVO
PAUSE
CAP DRIVE
From/To 03 MAIN (SERVO)
SWD 5V
MOTOR GND
CN601
CN1
CN2
51 DECK TERMINAL
CAP CTL V
CAP REV
SWD 5V
MOTOR GND
57 CAP MDA
MOTOR 12V
CN602
IC1
CONTROL LOGIC
55 LOADING MDA
M
LOADING MOTOR
A
B
C
E
F
G
H
1
2
3
4
5

3.6 VIDEO BLOCK DIAGRAM



05 VIDEO UNIT
03 MAIN(VIDEO)
IC1 Y
IC2
IC201 COLOUR
IC251 SECAM DET
IC361
V PULSE
EQ 2
EE
Q2 C6,R5 R6,R7
PB: DC LEVEL OF SHARPENESS IS CONTROLLED
REC: OPEN
D3
SHARP CTL
V PULSE ON
D6
SWD 5V
MUTE
WHITE LIMITER
BUFFER
Q3 R9,R10,C8
SYNC
AGC DET FILTER
D5
C9
PB
REC
ACC DET
ACC AMP
EE AMP
PB AMP
SHARPNESS CTL AMP
ANR
NOISE CANCEL
SUB NOISE CANCEL
CLAMP
LPF 1
SUB CLAMP DET
SUB CLAMP
DEEMP
DETAIL ENHANCER
DYNAMIC HPF
LIMITER
TNR/AUX
YNR CTL
L: THROUTH, H: YNR
PULSE DELAY
DOC
LPF
HPF
MIX
FREQ DEMOD
DOUBLE LIMITER CIRCUIT
YNR CIRCUIT
NR
NR SW
OFF
ON
W/D CUP
NLN EMP & DEEMP
NLN MIX
MAIN EMP
CARR & DEV
FREQ MOD
FM CAR INT CTL
SYNC SEP
D10
YNR PULSE
NC
Q1 L2,R3,C2
DETAIL ENHANCER OFF SW
D2
R11
L1
C1
R1
TP21
SYNC
C24
1H DL
3Fsc
Q5
LPF 2
R16 NC BAL
Q4
C7
R8
D4
SP
COL ROT
CN1
CN201
CN2
CN202
CN3
CN203
CN701
CN204
Q351
PROG
D213
R245
Q208
Q207
Q209
D204
VIDEO
From/To 03 MAIN (ON SCREEN)
PICTURE MUTE
EQ201
Q210
To RF CONVERTER
R226 SP RF EQ
R313 LP RF EQ
Q206
ES AMP
Q304
R312
Q305
Q308
Q309
D306
D314
R316
D307
ES
TP210 VIDEO OUT
VIDEO OUT
VIDEO IN
A/V IN/OUT
Q204
Q361,Q362 Q368
TNR VIDEO
From 08 TUNER CTL,CN1
R311 LP REC COLOUR
Q205 Q303
SP/LP SW
TP205 REC COLOUR
R220 SP REC COLOUR
Q203
REC FM & COL MIX
REC FM/COL
PB FM
PB COLOUR
From/To 43 PRE/REC,CN1
AMP
EQ
Q201
LPF201
TP206 PB FM
AUX
R205
D201
D210
D202
Q202
Q364–Q367 D361–D375
FADER CTL
FADER
TP251
COLOUR ROT
R388
Q369
D376
REC START
1CD
1T1
1T2
C368
R385 FADER TIMING
D377
STNC
Q205
BPF 201
Q204
C215
ACC DET FILTER
Q203 ,L202 R207,R209
D202
REC AFC/PB APC FILTER
C204,C207
C210
2H COMB DRIVE
AUTO BAL
MAIN CONV
PB KILLER
REC KILLER AMP
REC/PB
BPF 202
1/2 CD
1/4 CD
SUB CONV
INV
4 PHASE SHIFT
100K
REC AFC
CNT
PB AFC
PULSE GEN
321fH VCO
ID DET
COLOUR DET
PB APC
VXO
4.43 NTSC DET
H.SYNC
BURST GATE
X3
CF 201
X201
COL ROT CTL
GND
H SYNC TRAP
D251
SECAM
B/W
PB AFC FILTER
C212
C211
REC APC FILTER
D252
3Fsc(CN3-④)
LC251 SECAM DET
C254,R254
C255
C257
FH/2 DET
COMP
FM DET
LIMITER SW
Vcc
COMP 1
BGP
MM
R256
AFT
PAL
A
B
DL201
DL
C253 R252
FILTER
R222
TRAP
C261 L251
D253
A B C D E F G H
6 5 4 3 2 1

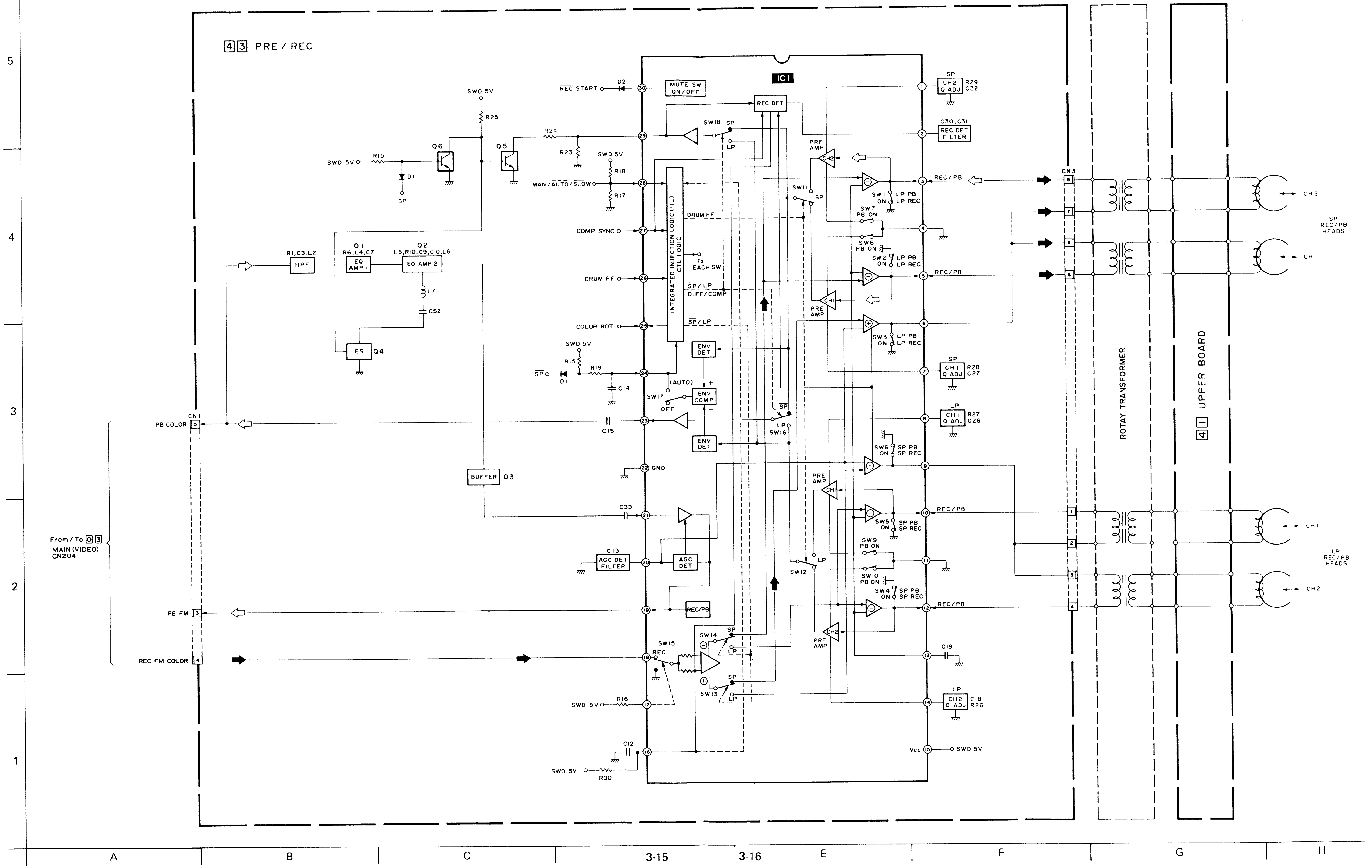
3.7 AUDIO BLOCK DIAGRAM


06 TERMINAL
03 MIC/MIX (MAIN)
09 AUDIO
36 JACK
IC1
IC2
IC3
A/V IN/OUT
AUDIO IN (L)
AUDIO IN (R)
AMP
VF
MIC AMP
MIC IN FRONT
MIC IN
MIC CTL
MIX VOL
R1 MIC/MIX
Q104
ES
R14
R15
JP1
CN2
CN3
CN4
CN13
ERASE BIAS OSC T1, Q2
R9 BAIS LEVEL
SWD 12V
R11
D22
D3
Q9
Q8
REC
REC START
AUDIO 11V
TP33
ERASE
Q17
D12
FE ON
TP31
REC/PB HEAD
CN5
R8
TP32
AUDIO ERASE
TP34
FULL ERASE OSC T2, Q16
CN6
FULL ERASE
C63
Q7
DROP OUT CTL
BIL CTL
C27
R21
C28
L3
Q5
C33
R27
Q6
AUDIO 11V
R15
R72
SP
EN-CODER
DE-CODER
CCA
1/2 Vcc
V-I CONV
WHIGHT
DET
AGC/CTL
INPUT SELECTED
HIFI (L)
HIFI (R)
AUX (R)
AUX (L)
TNR (L)
TNR (R)
ALC ON (CN12-6)
TNR/SC/AUX (From CN3-6)
C4
C13
C3
C25
C1
C6
C14
C47
C16
C10
REC/PB/EE
BUFFER
LPF
MUTE
LIMITER
VCO
PC
PB
HOLD
PRE EMP DE EMP
DOC DET
HOLD CTL
RF
NORM (L)
NORM (R)
L/MIX/R/SAP
PB AMP
NORMAL MIX HIFI
LEFT STEREO RIGHT
LINE
HEAD-PHONE
PHONE CTL
MIX
HP LEVEL
HIFI REC/EE/PB CTL NORM
SWD 5V
R68
R62
HIFI MODE
NORMAL MODE
R58
CH SEL (From CN3-1)
HIFI/MIX/NORM
C43
D7
R64
AUDIO
PB HIFI MUTE
MUTE
(From CN2-7)
R49
R47
HIFI REC START
Q3
BPF 2
BPF 1
R50
R51
R7
R4
R52
R83
R84
R40 (L) EE LEVEL
R41 (R) EE LEVEL
D9
HIFI MODE
MODE CTL
REC/EE/PB/ADUB
TK AMP
EQ
AMP
AGC AMP
SW1
SW2
SW3
SW4
CH1
CH2
DAMP ADJ
R44, C53
R43 C49
R42
C48
C52
C56
C72
C73
Q12
Q13
PB 5V
PB GAIN CTL
R48
D4
TP53 PB FM
AUDIO FF
Q23
D1
D2
CN7
CN8
L (MAIN)
R (SUB)
From 14 DEMOD, CN2
UNSW 11V
CN12
CN1
L+
R+
L−
R−
R5 REC LEVEL (L)
R6 REC LEVEL (R)
REC/PB HEAD
CN9
06 TERMINAL
AUDIO (L)
AUDIO (R)
A/V IN/OUT
RF AUDIO (To RF CONV)
CN11
IND (L)
Hi-Fi TRACK
IND (R)
R73 LEVEL IND (L)
R74 LEVEL IND (R)
To 28 SW/DISPLAY CN10
Q1
PB 5V From Q4-E
R82
R81
Q22
CN15
AUDIO FM
To 03 MAIN (SERVO)
CN10
HP OUT (L)
HP OUT (R)
To 36 JACK, CN3
A
B
C
D
E
F
G
H
1
2
3
4
5

IC 3

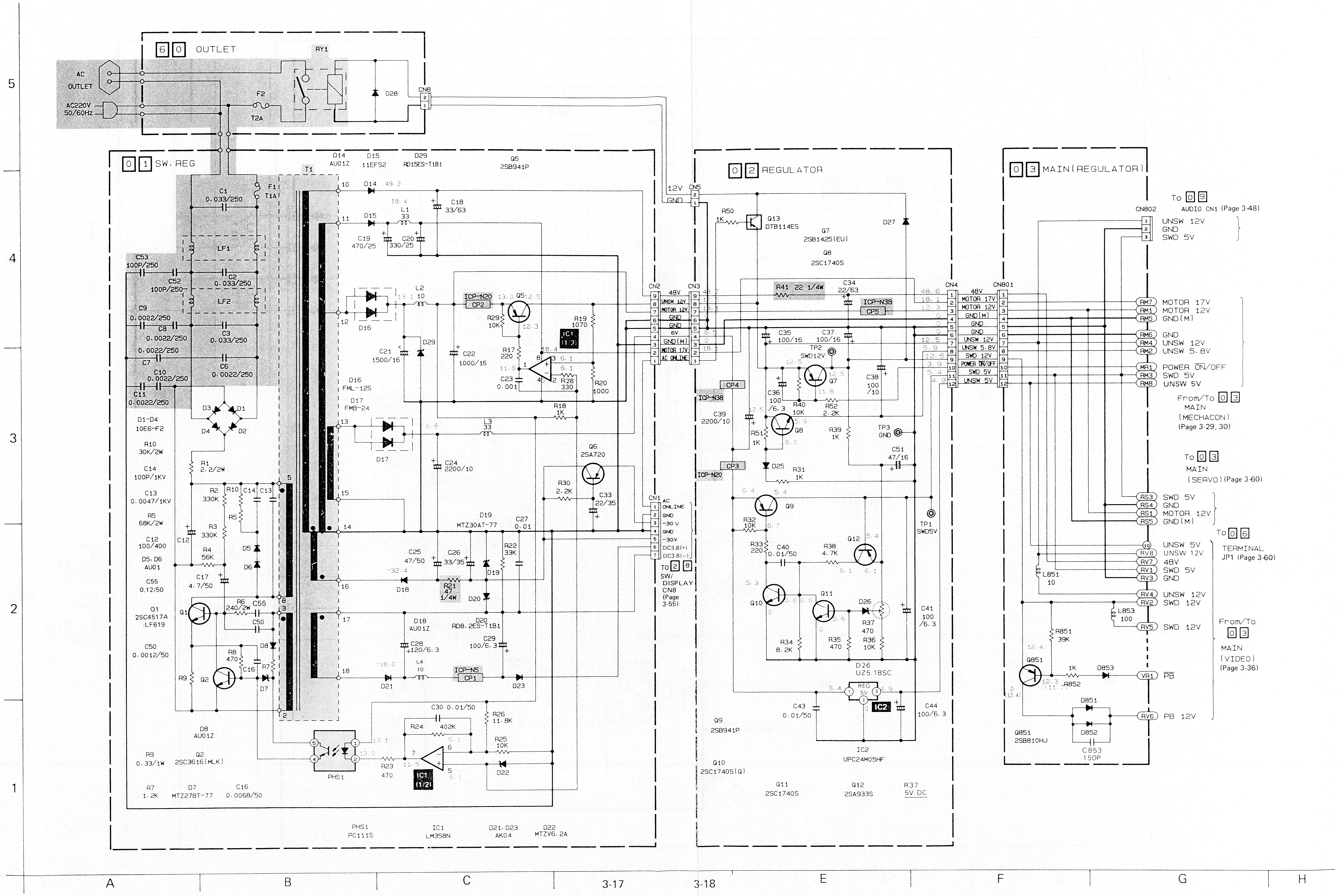
HIFI			MIX			NORM			PINS
REC	EE	PB	REC	EE	PB	REC	EE	PB	
L	L	H	L	L	H	L	L	H	31
L	M	H	L	M	H	L	M	H	32

3.8 PRE/REC BLOCK DIAGRAM



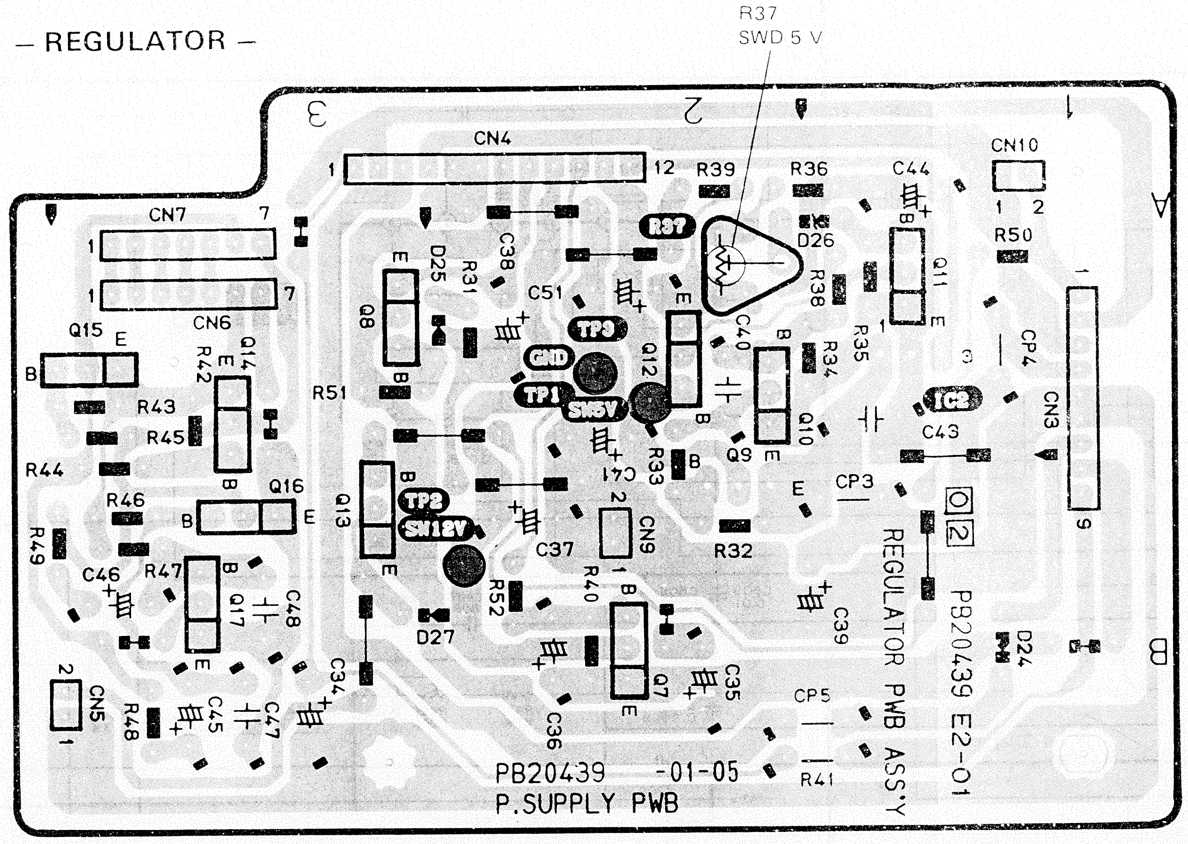
6
5
4
3
2
1
A
B
C
D
E
F
G
H
43 PRE / REC
IC1
REC START
D2
MUTE SW ON/OFF
REC DET
SWD 5V
R25
R24
R23
SW18
SP
LP
Q6
Q5
SWD 5V
R15
D1
SP
MAN/AUTO/SLOW
R18
R17
COMP SYNC
INTEGRATED INJECTION LOGIC (IIL) CTL LOGIC
DRUM FF
To EACH SW
SP/LP D.FF/COMP
SP/LP
R1,C3,L2
HPF
Q1 R6,L4,C7
EQ AMP 1
Q2 L5,R10,C9,C10,L6
EQ AMP 2
L7
C52
ES
Q4
DRUM FF
COLOR ROT
SWD 5V
R15
R19
D1
C14
(AUTO)
SW17
OFF
ENV DET
ENV COMP
ENV DET
SW16
CN1
PB COLOR
C15
BUFFER Q3
GND
C33
C13 AGC DET FILTER
AGC DET
REC/PB
PB FM
REC FM COLOR
SW15
REC
SW14
SW13
SWD 5V
R16
C12
SWD 5V
R30
From / To 03 MAIN (VIDEO) CN204
SP CH2 Q ADJ R29 C32
C30,C31 REC DET FILTER
PRE AMP CH2
SW11
SW1 ON LP PB LP REC
SW7 PB ON
SW8 PB ON
SW2 ON LP PB LP REC
PRE AMP CH1
SW3 ON LP PB LP REC
SP CH1 Q ADJ R28 C27
LP CH1 Q ADJ R27 C26
SW6 ON SP PB SP REC
PRE AMP CH1
SW5 ON SP PB SP REC
SW9 PB ON
SW12
SW10 PB ON
SW4 ON SP PB SP REC
PRE AMP CH2
C19
LP CH2 Q ADJ C18 R26
Vcc
SWD 5V
REC/PB
CN3
ROTAY TRANSFORMER
41 UPPER BOARD
CH2
SP REC/PB HEADS
CH1
CH1
LP REC/PB HEADS
CH2

3.9 SW REG, REGULATOR AND OUTLET SCHEMATIC DIAGRAMS

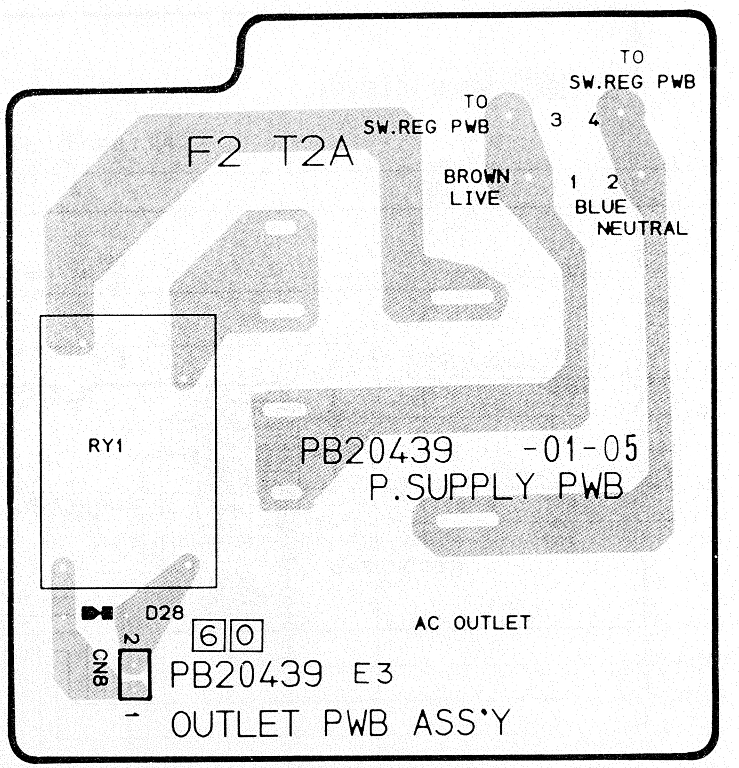

60 OUTLET
AC OUTLET
AC220V 50/60Hz
F2 T2A
RY1
D28
CN8
01 SW. REG
02 REGULATOR
03 MAIN (REGULATOR)
C1 0.033/250
F1 T1A
LF1
LF2
C53 100P/250
C52 100P/250
C2 0.033/250
C9 0.0022/250
C8 0.0022/250
C3 0.033/250
0.0022/250
C7
C6 0.0022/250
C10 0.0022/250
C11 0.0022/250
D1 D2 D3 D4
D1-D4 10E6-F2
R10 30K/2W
C14 100P/1KV
C13 0.0047/1KV
R5 68K/2W
C12 100/400
D5, D6 AU01
C55 0.12/50
Q1 2SC4517A -LF619
C50 0.0012/50
R9 0.33/1W
R7 1.2K
D8 AU01Z
Q2 2SC3616(MLK)
D7 MTZ27BT-77
C16 0.0068/50
R1 2.2/2W
R2 330K
R3 330K
R4 56K
C17 4.7/50
R6 240/2W
R8 470
T1
D14 AU01Z
D15 11EFS2
D29 RD15ES-T1B1
Q5 2SB941P
C18 33/63
L1 33
C19 470/25
C20 330/25
L2 10
D16
ICP-N20 CP2
R29 10K
R19 1070
IC1 (1/2)
C21 1500/16
C22 1000/16
R17 220
C23 0.001
R28 330
R20 1000
D16 FML-12S
D17 FMB-24
R18 1K
L3 33
C24 2200/10
Q6 2SA720
R30 2.2K
C33 22/35
D19 MTZ30AT-77
C27 0.01
C25 47/50
C26 33/35
R22 33K
D18
R21 47 1/4W
D20
D18 AU01Z
D20 RD8.2ES-T1B1
C28 120/6.3
C29 100/6.3
L4 10
ICP-N5 CP1
D21
D23
C30 0.01/50
R24 402K
R26 11.8K
R25 10K
R23 470
D22
PHS1
PHS1 PC111S
IC1 LM358N
D21, D23 AK04
D22 MTZV6.2A
CN2
CN3
48V
UNSW 12V
MOTOR 12V
GND
6V
GND(M)
MOTOR 17V
AC ONLINE
CN1
AC ONLINE
GND
-30 V
GND
-30V
DC3.8(+)
DC3.8(-)
To 28 SW/DISPLAY CN8 (Page 3-55)
12V CN5
GND
R50 1K
Q13 DTB114ES
D27
Q7 2SB1425(EU)
Q8 2SC1740S
R41 22 1/4W
C34 22/63
ICP-N38 CP5
C35 100/16
C37 100/16
TP2 SWD12V
C38 100/10
CP4
ICP-N38
C39 2200/10
C36 100/6.3
R40 10K
R52 2.2K
R51 1K
R39 1K
TP3 GND
C51 47/16
CP3
ICP-N20
D25
R31 1K
Q9
TP1 SWD5V
R32 10K
R33 220
C40 0.01/50
R38 4.7K
Q12
Q10
Q11
D26
R37 470
R36 10K
C41 100/6.3
R34 8.2K
R35 470
D26 UZ5.1BSC
REG 5V
IC2
C43 0.01/50
C44 100/6.3
Q9 2SB941P
Q10 2SC1740S(Q)
Q11 2SC1740S
Q12 2SA933S
R37 5V DC
IC2 UPC24M05HF
CN4
CN801
48V
MOTOR 17V
MOTOR 12V
GND(M)
GND
UNSW 12V
UNSW 5.8V
SWD 12V
POWER ON/OFF
SWD 5V
UNSW 5V
CN802
To 09 AUDIO CN1 (Page 3-48)
UNSW 12V
GND
SWD 5V
RM7 MOTOR 17V
RM1 MOTOR 12V
RM5 GND(M)
RM6 GND
RM4 UNSW 12V
RM2 UNSW 5.8V
MR1 POWER ON/OFF
RM3 SWD 5V
RM8 UNSW 5V
From/To 03 MAIN (MECHACON) (Page 3-29, 30)
To 03 MAIN (SERVO) (Page 3-60)
RS3 SWD 5V
RS4 GND
RS1 MOTOR 12V
RS5 GND(M)
To 06 TERMINAL JP1 (Page 3-60)
10 UNSW 5V
RV8 UNSW 12V
RV7 48V
RV1 SWD 5V
RV3 GND
L851 10
RV4 UNSW 12V
RV2 SWD 12V
L853 100
RV5 SWD 12V
From/To 03 MAIN (VIDEO) (Page 3-36)
R851 39K
Q851
1K
D853
R852
VR1 PB
D851
D852
RV6 PB 12V
C853 150P
Q851 2SB810HJ
A B C E F G H
1 2 3 4 5

3.10 SW REG, REGULATOR AND OUTLET CIRCUIT BOARDS

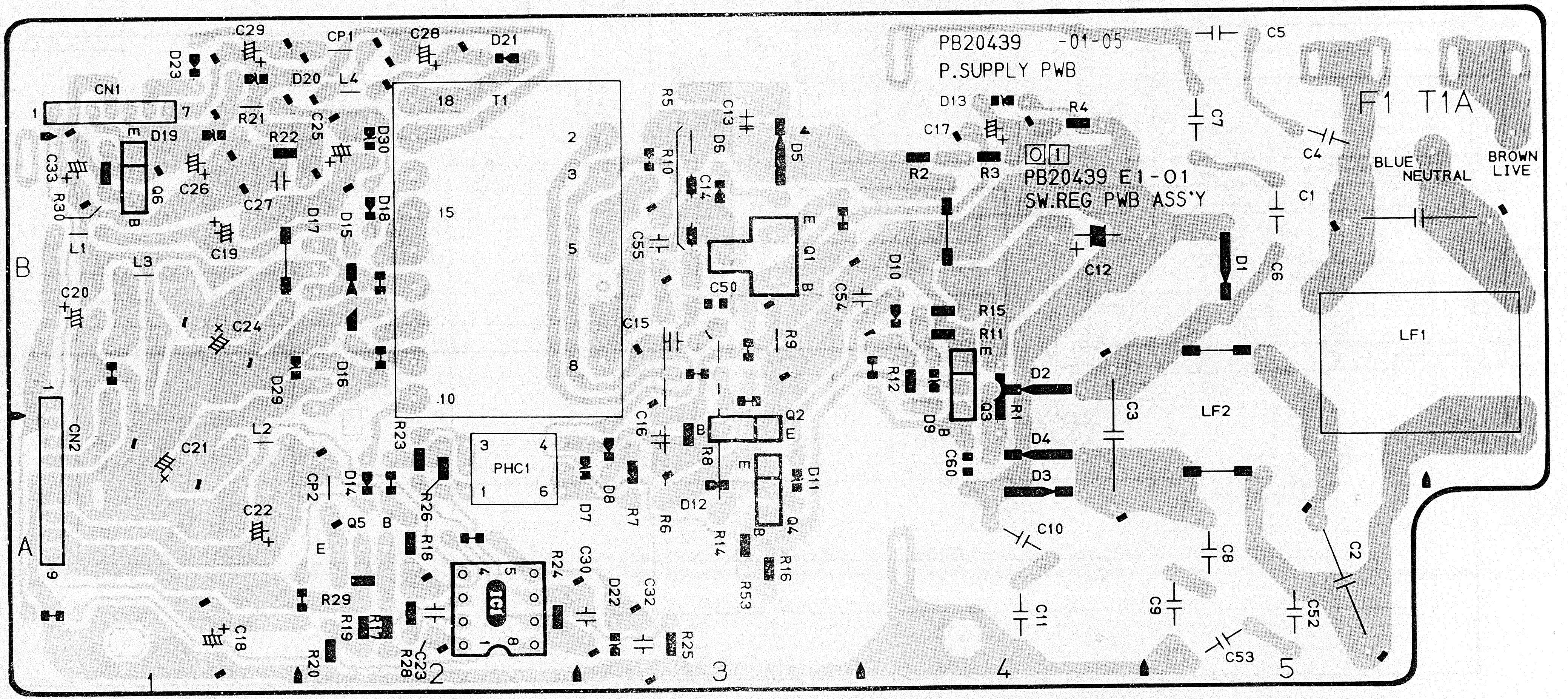
– REGULATOR –


R37
SWD 5 V
CN4
CN7
CN6
CN10
CN3
CN9
CN5
TP1
TP2
TP3
GND
SW5V
SW12V
IC3
PB20439 -01-05
P.SUPPLY PWB
PB20439 E2-01
REGULATOR PWB ASS'Y

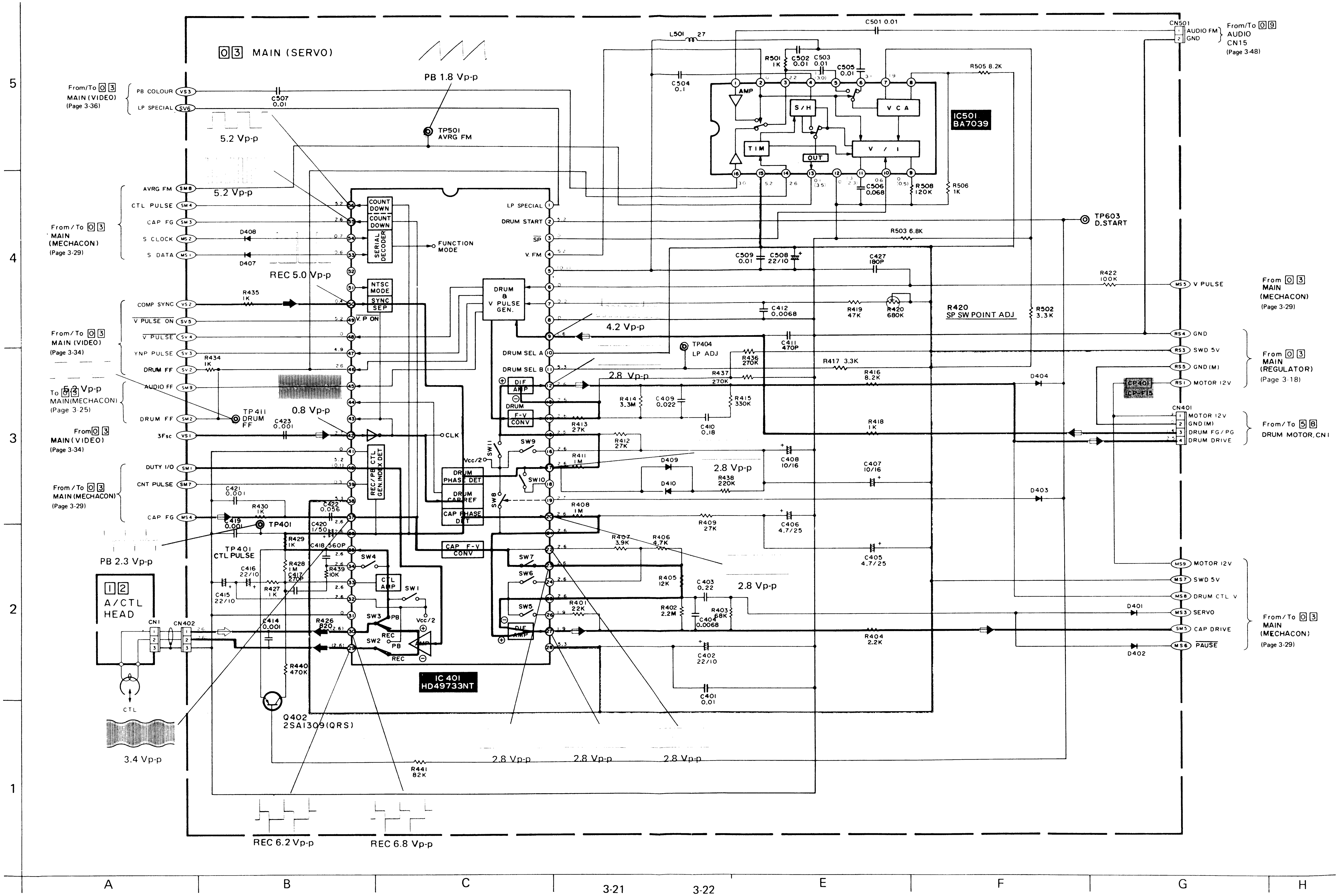
– SW. REG –


F2 T2A
TO SW.REG PWB
TO SW.REG PWB
3 4
1 2
BROWN LIVE
BLUE NEUTRAL
RY1
PB20439 -01-05
P.SUPPLY PWB
D28
AC OUTLET
CN8
60
PB20439 E3
OUTLET PWB ASS'Y

– OUTLET –


PB20439 -01-05
P.SUPPLY PWB
01
PB20439 E1-01
SW.REG PWB ASS'Y
F1 T1A
BLUE NEUTRAL
BROWN LIVE
CN1
CN2
T1
PHC1
IC1
Q1
Q2
Q3
Q4
Q5
Q6
LF1
LF2

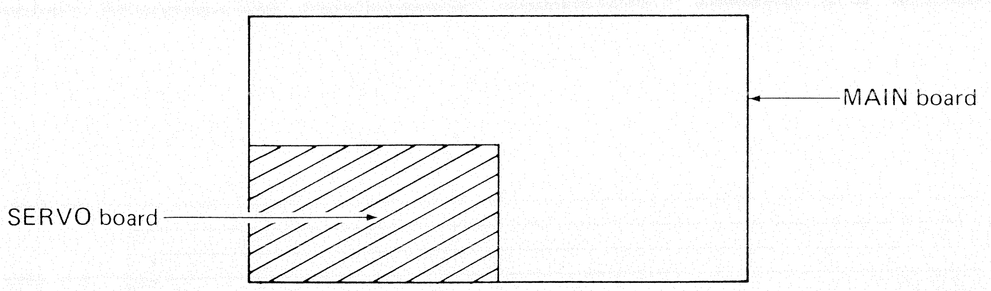
3.11 SERVO SCHEMATIC DIAGRAM

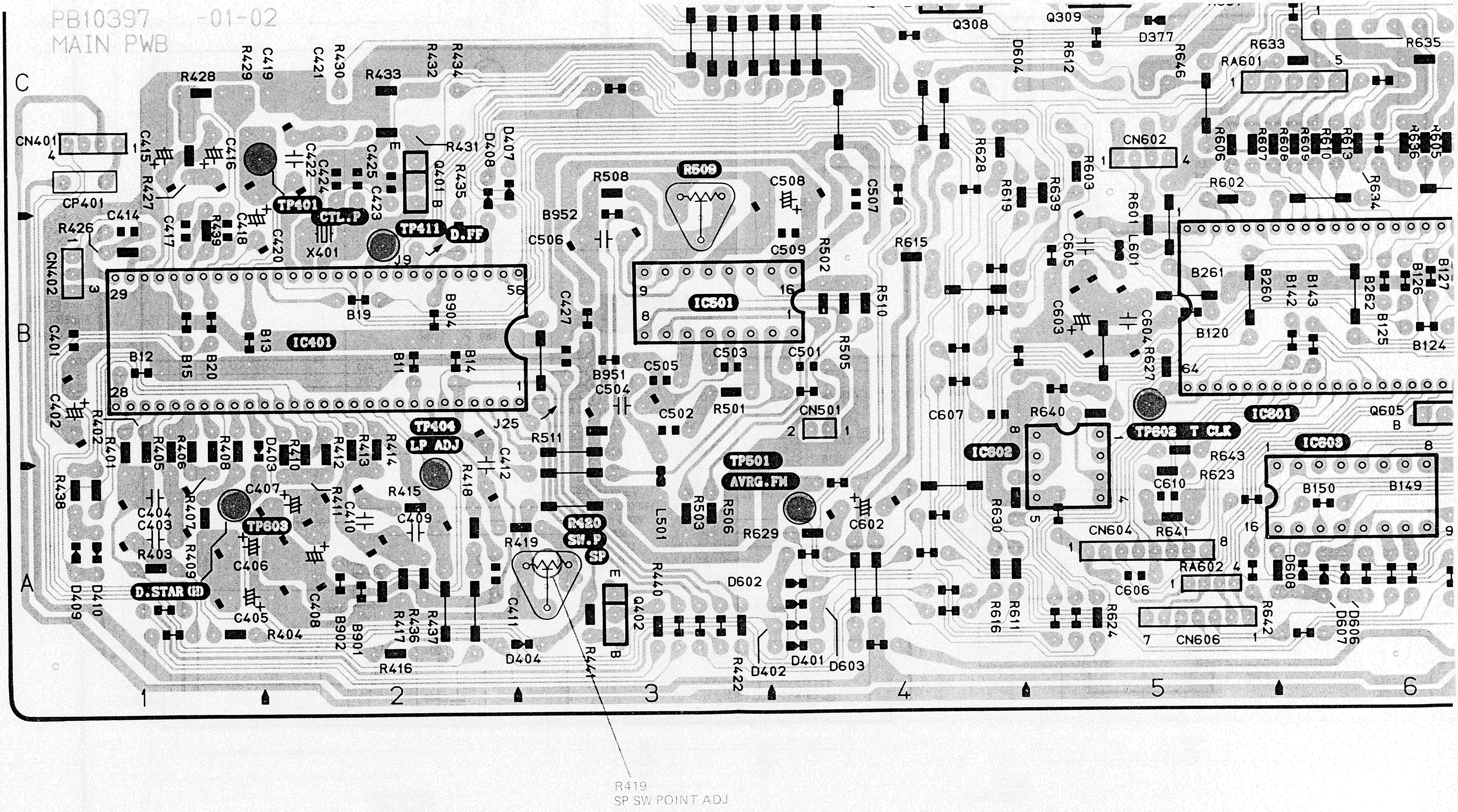


03 MAIN (SERVO)
From/To 03 MAIN (VIDEO) (Page 3-36)
PB COLOUR
LP SPECIAL
C507 0.01
5.2 Vp-p
PB 1.8 Vp-p
TP501 AVRG FM
From/To 03 MAIN (MECHACON) (Page 3-29)
AVRG FM
CTL PULSE
CAP FG
S CLOCK
S DATA
D408
D407
REC 5.0 Vp-p
COUNT DOWN
SERIAL DECODER
FUNCTION MODE
NTSC MODE
SYNC SEP
V.P ON
From/To 03 MAIN (VIDEO) (Page 3-34)
COMP SYNC
V PULSE ON
V PULSE
YNP PULSE
DRUM FF
R435 1K
R434 1K
To 03 MAIN(MECHACON) (Page 3-25)
AUDIO FF
DRUM FF
TP411 DRUM FF
0.8 Vp-p
From 03 MAIN (VIDEO) (Page 3-34)
3Fsc
C423 0.001
CLK
From/To 03 MAIN (MECHACON) (Page 3-29)
DUTY I/O
CNT PULSE
CAP FG
C421 0.001
R430 1K
C419 0.001
TP401
PB 2.3 Vp-p
TP401 CTL PULSE
C422 0.056
C420 1/50
R429 1K
C418 560P
R428 1M
R439 10K
C416 22/10
C417 27P
C415 22/10
R427 1K
C414 0.001
R426 820
R440 470K
REC/PB CTL GEN.INDEX DET
CTL AMP
SW1
SW3
SW4
SW2
PB
REC
AMP
Vcc/2
12 A/CTL HEAD
CN1
CN402
CTL
3.4 Vp-p
Q402 2SA1309(QRS)
R441 82K
IC 401 HD49733NT
REC 6.2 Vp-p
REC 6.8 Vp-p
DRUM & V PULSE GEN.
LP SPECIAL
DRUM START
SP
V.FM
DRUM SEL A
DRUM SEL B
DIF AMP
DRUM F-V CONV
DRUM PHASE DET
DRUM CAR REF
CAP PHASE DET
CAP F-V CONV
Vcc/2
SW5
SW6
SW7
SW8
SW9
SW10
SW11
4.2 Vp-p
2.8 Vp-p
TP404 LP ADJ
R436 270K
R437 270K
R414 3.3M
C409 0.022
R415 330K
C410 0.18
R413 27K
R412 27K
R411 1M
D409
D410
R438 220K
R408 1M
R409 27K
R407 3.9K
R406 4.7K
R405 12K
C403 0.22
R401 22K
R402 2.2M
R403 68K
C404 0.0068
C402 22/10
C401 0.01
L501 27
C501 0.01
C504 0.1
R501 1K
C502 0.01
C503 0.01
C505 0.01
R505 8.2K
AMP
S/H
VCA
TIM
OUT
V/I
IC501 BA7039
C506 0.068
R508 120K
R506 1K
TP603 D.START
R503 6.8K
C509 0.01
C508 22/10
C427 180P
C412 0.0068
R419 47K
R420 680K
R420 SP SW POINT ADJ
R502 3.3K
R422 100K
C411 470P
R417 3.3K
R416 8.2K
D404
R418 1K
C408 10/16
C407 10/16
D403
C406 4.7/25
C405 4.7/25
D401
D402
R404 2.2K
CN501
AUDIO FM
GND
From/To 09 AUDIO CN15 (Page 3-48)
V PULSE
From 03 MAIN (MECHACON) (Page 3-29)
GND
SWD 5V
GND (M)
MOTOR 12V
From 03 MAIN (REGULATOR) (Page 3-18)
CP401 ICP-F15
CN401
MOTOR 12V
GND (M)
DRUM FG/PG
DRUM DRIVE
From/To 58 DRUM MOTOR.CN1
MOTOR 12V
SWD 5V
DRUM CTL V
SERVO
CAP DRIVE
PAUSE
From/To 03 MAIN (MECHACON) (Page 3-29)
1
2
3
4
5
A
B
C
D
E
F
G
H

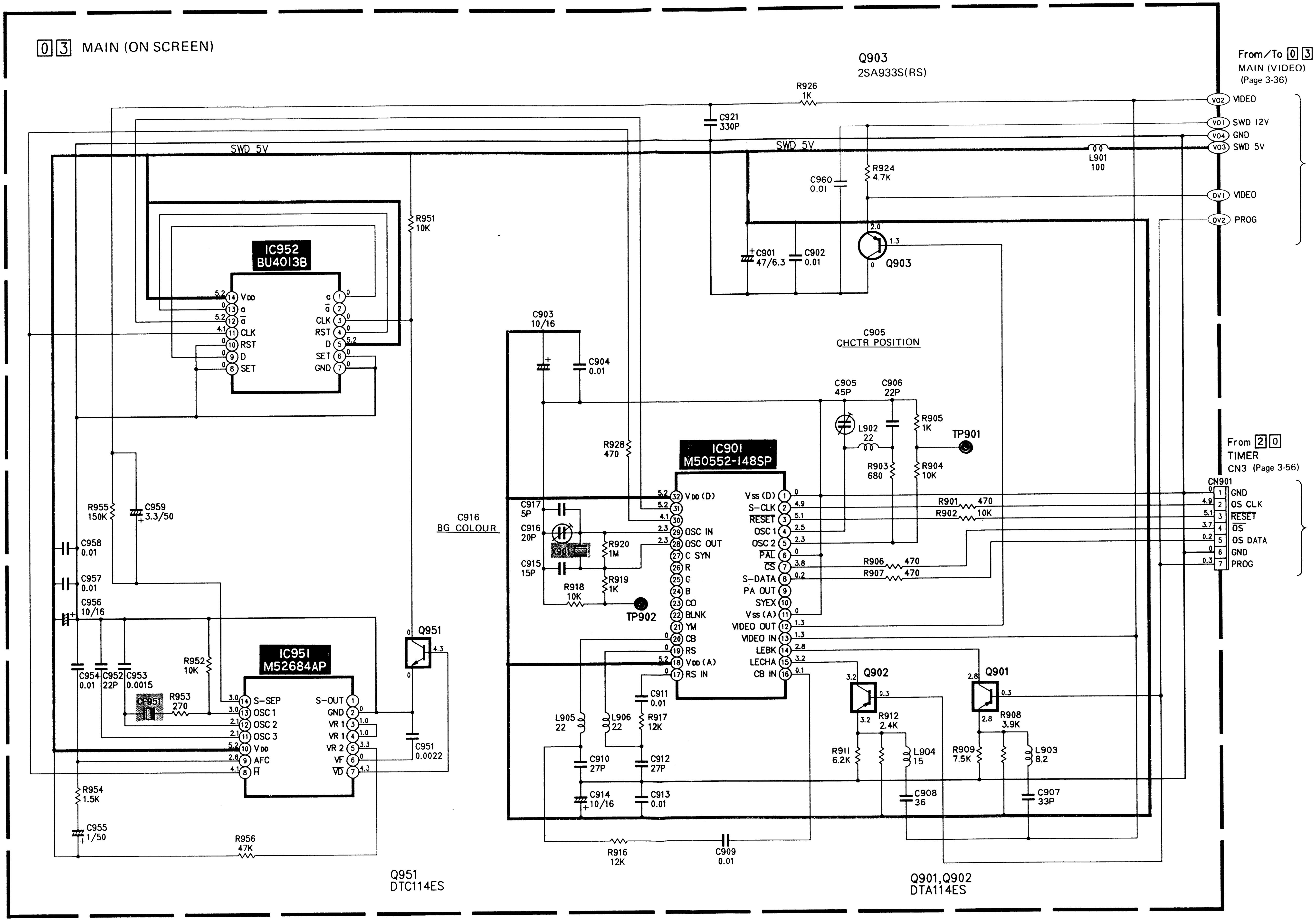
3.12 SERVO (MAIN) CIRCUIT BOARD

● MAIN board assembly is located in page 3-67, 68


MAIN board
SERVO board

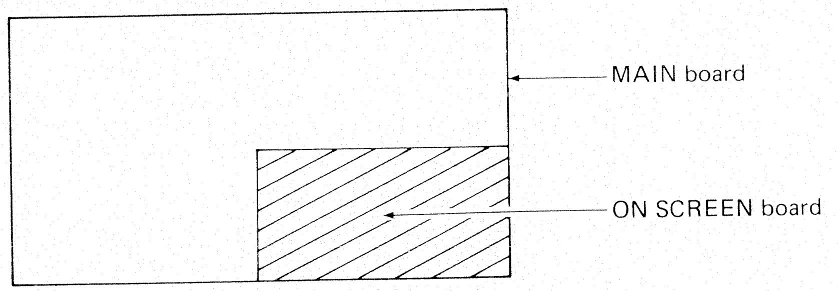

PB10397 -01-02
MAIN PWB
C
B
A
1
2
3
4
5
6
CN401
CP401
CN402
IC401
IC501
IC601
IC602
IC603
TP401
CTL.P
TP411
D.FF
TP404
LP ADJ
TP603
D.STAR (H)
TP501
AVRG.FM
TP602
T CLK
R420
SW.P
SP
R509
X401
J9
J25
Q401
Q402
Q308
Q309
Q605
L501
L601
R419
SP SW POINT ADJ

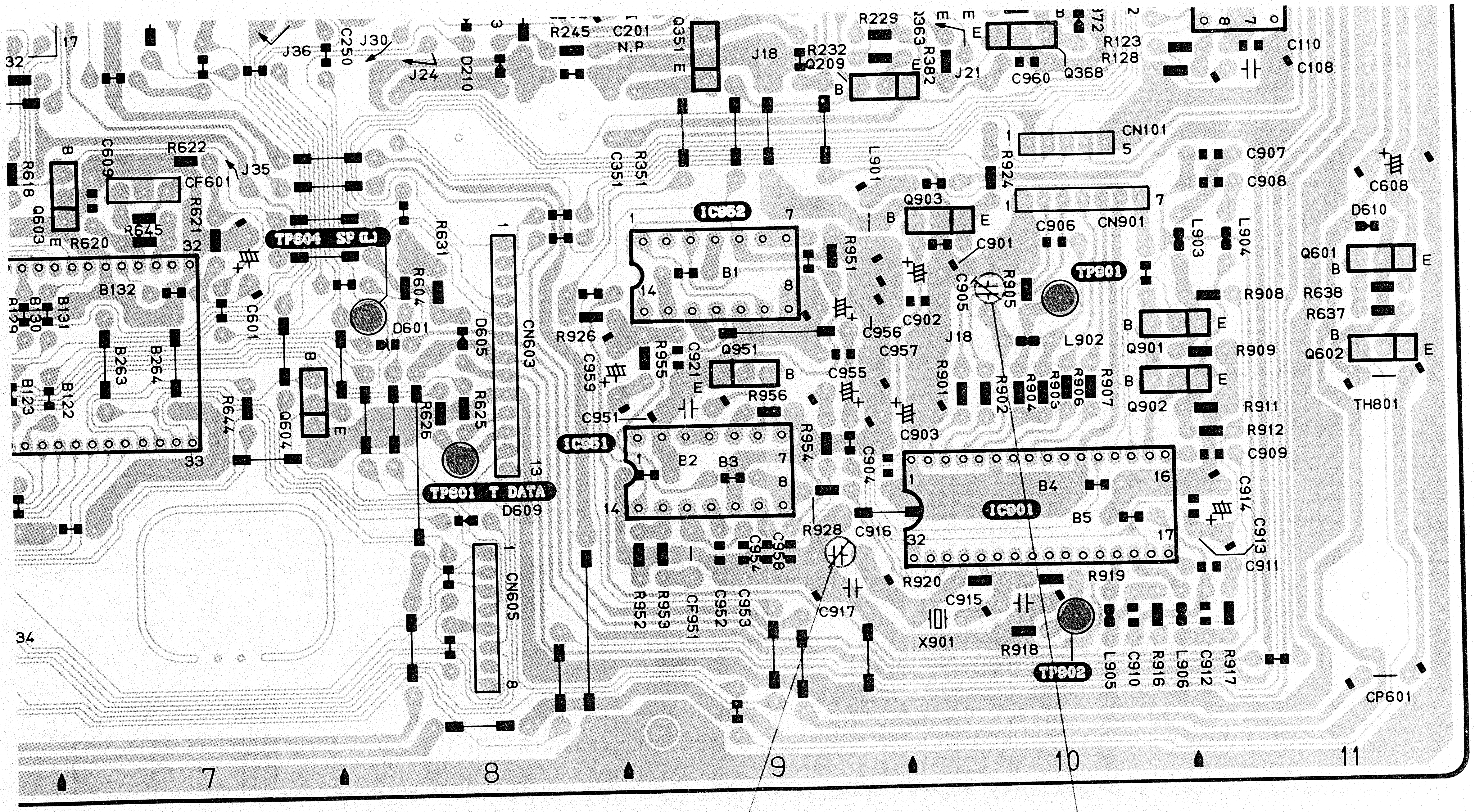
3.13 ON SCREEN SCHEMATIC DIAGRAM


03 MAIN (ON SCREEN)
From/To 03
MAIN (VIDEO)
(Page 3-36)
VO2 VIDEO
VO1 SWD 12V
VO4 GND
VO3 SWD 5V
OV1 VIDEO
OV2 PROG
From 20
TIMER
CN3 (Page 3-56)
CN901
1 GND
2 OS CLK
3 RESET
4 OS
5 OS DATA
6 GND
7 PROG
SWD 5V
Q903
2SA933S(RS)
R926 1K
C921 330P
C960 0.01
R924 4.7K
L901 100
C901 47/6.3
C902 0.01
IC952
BU4013B
VDD
a
ā
CLK
RST
D
SET
GND
R951 10K
C903 10/16
C904 0.01
C905 CHCTR POSITION
C905 45P
C906 22P
L902 22
R905 1K
TP901
R903 680
R904 10K
R928 470
IC901
M50552-148SP
VDD (D)
OSC IN
OSC OUT
C SYN
R
G
B
CO
BLNK
YM
CB
RS
VDD (A)
RS IN
VSS (D)
S-CLK
RESET
OSC 1
OSC 2
PAL
CS
S-DATA
PA OUT
SYEX
VSS (A)
VIDEO OUT
VIDEO IN
LEBK
LECHA
CB IN
R901 470
R902 10K
R906 470
R907 470
C916 BG COLOUR
C917 5P
C916 20P
C915 15P
X901
R920 1M
R919 1K
R918 10K
TP902
R955 150K
C959 3.3/50
C958 0.01
C957 0.01
C956 10/16
R952 10K
C954 0.01
C952 22P
C953 0.0015
CF951
R953 270
IC951
M52684AP
S-SEP
OSC 1
OSC 2
OSC 3
VDD
AFC
H
S-OUT
GND
VR 1
VR 1
VR 2
VF
VD
Q951
C951 0.0022
R954 1.5K
C955 1/50
R956 47K
L905 22
L906 22
C911 0.01
R917 12K
C910 27P
C912 27P
C914 10/16
C913 0.01
R916 12K
C909 0.01
Q902
Q901
R912 2.4K
R911 6.2K
L904 15
C908 36
R908 3.9K
R909 7.5K
L903 8.2
C907 33P
Q951
DTC114ES
Q901,Q902
DTA114ES

3.14 ON SCREEN (MAIN) CIRCUIT BOARD

● MAIN board assembly is located in page 3-67, 68

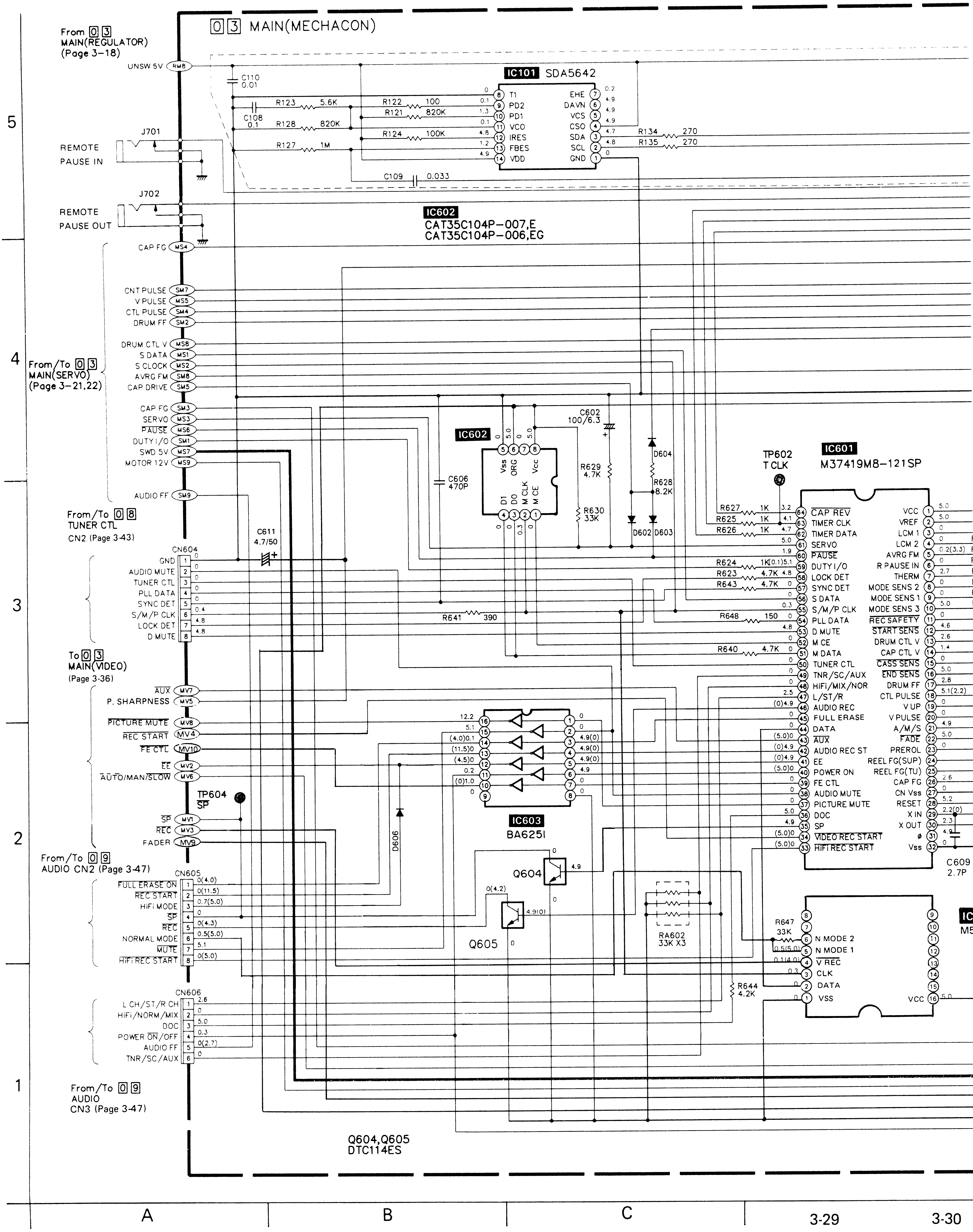

MAIN board
ON SCREEN board


R245
C201
N.P
Q351
J18
R232
Q209
R229
R382
J21
C960
Q368
R123
R128
C110
C108
J36
C250
J30
J24
D210
R618
Q603
R622
CF601
J35
R621
R645
R620
C609
R351
C351
L901
R924
CN101
C907
C908
C608
D610
IC952
B1
Q903
C906
CN901
L903
L904
Q601
R638
R637
Q602
TP604 SP (L)
R631
R604
D601
D605
CN603
B132
B131
B130
B263
B264
B123
B122
R644
Q604
R626
R625
C601
R951
C905
C901
TP901
C902
C956
C957
J18
R926
C959
R955
C921
Q951
R956
C955
R901
R902
R904
R903
R906
R907
L902
Q901
Q902
R908
R909
R911
R912
C909
TH801
C951
IC951
B2
B3
R954
C903
C904
IC901
B4
B5
C914
C913
C911
TP601 T DATA
D609
CN605
R928
C916
R920
R919
C915
C917
X901
R918
TP902
R952
R953
CF951
C952
C953
C954
C958
L905
C910
R916
L906
C912
R917
CP601
7
8
9
10
11

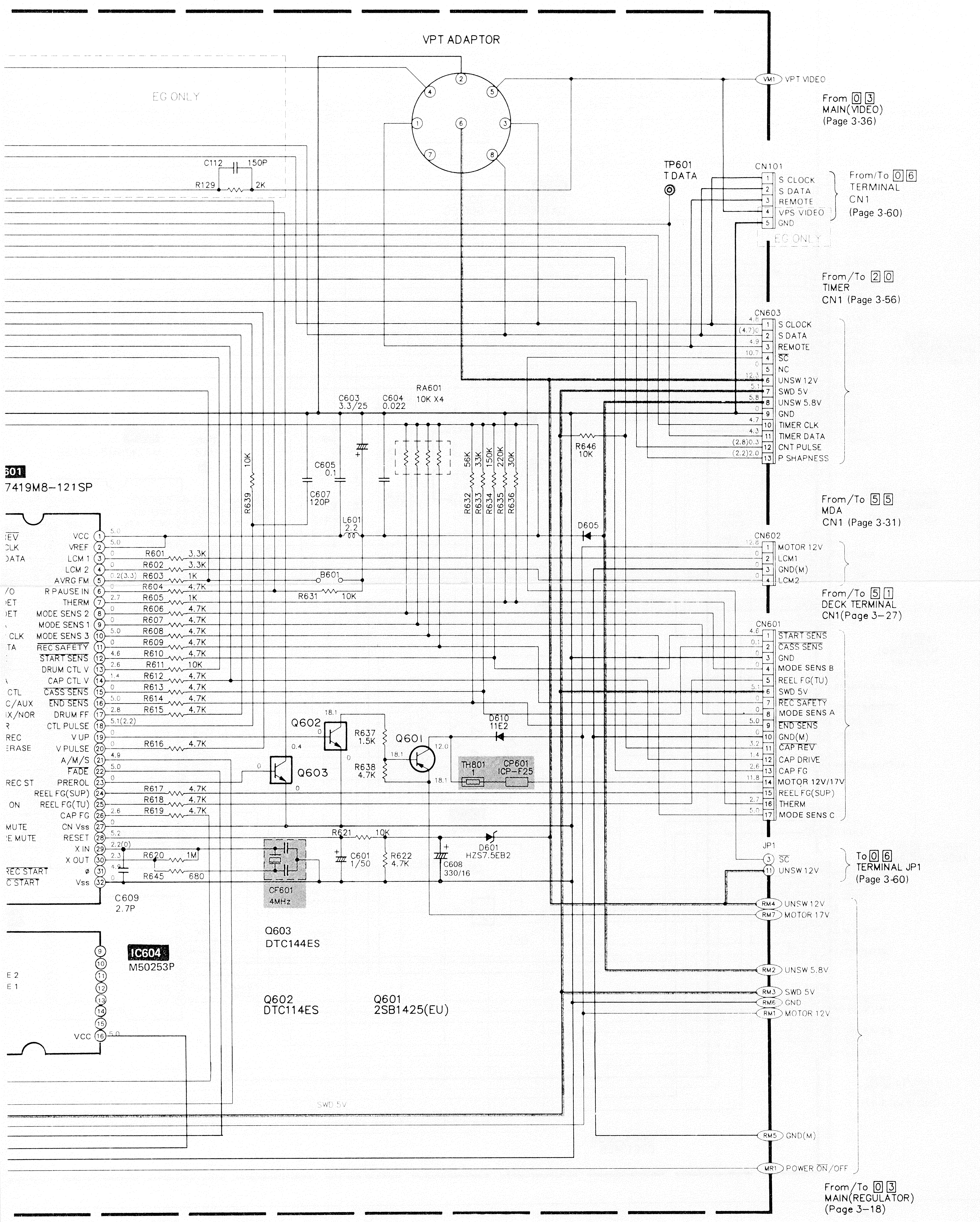
C916
BG COLOUR

C905
CHCTR POSITION

3.15 SYSTEM CTL SCHEMATIC DIAGRAM

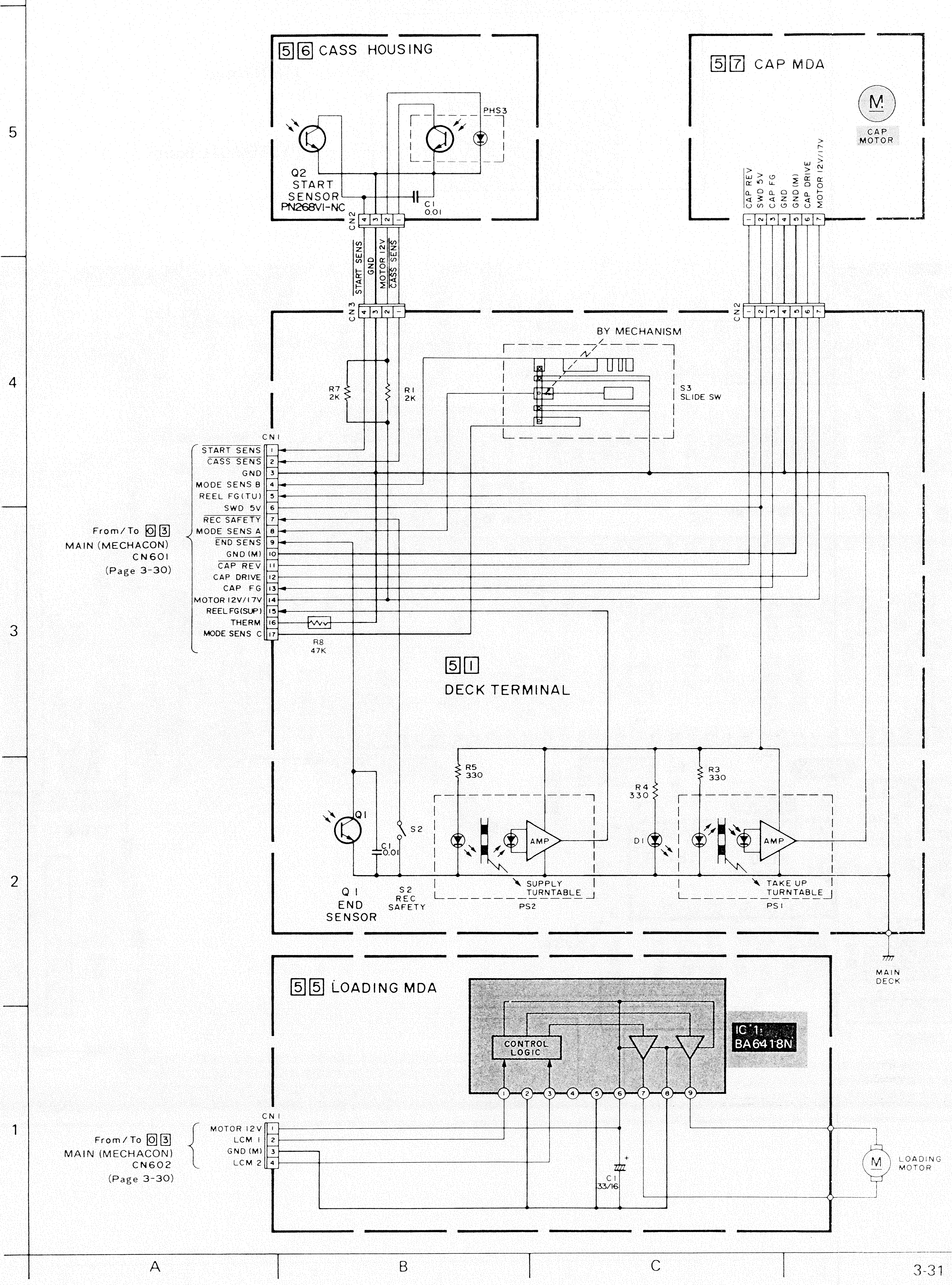


03 MAIN(MECHACON)
From 03 MAIN(REGULATOR) (Page 3-18)
UNSW 5V RM8
C110 0.01
C108 0.1
R123 5.6K
R128 820K
R127 1M
R122 100
R121 820K
R124 100K
C109 0.033
IC101 SDA5642
T1 PD2 PD1 VCO IRES FBES VDD
EHE DAVN VCS CSO SDA SCL GND
R134 270
R135 270
J701 REMOTE PAUSE IN
J702 REMOTE PAUSE OUT
IC602 CAT35C104P-007,E CAT35C104P-006,EG
CAP FG MS4
CNT PULSE SM7
V PULSE MS5
CTL PULSE SM4
DRUM FF SM2
DRUM CTL V MS8
S DATA MS1
S CLOCK MS2
AVRG FM SM8
CAP DRIVE SM5
CAP FG SM3
SERVO MS3
PAUSE MS6
DUTY I/O SM1
SWD 5V MS7
MOTOR 12V MS9
AUDIO FF SM9
From/To 03 MAIN(SERVO) (Page 3-21,22)
C602 100/6.3
IC602
Vss ORG Vcc D1 D0 M CLK M CE
C606 470P
R629 4.7K
R630 33K
D604
R628 8.2K
D602 D603
TP602 T CLK
IC601 M37419M8-121SP
From/To 08 TUNER CTL CN2 (Page 3-43)
C611 4.7/50
CN604
GND AUDIO MUTE TUNER CTL PLL DATA SYNC DET S/M/P CLK LOCK DET D MUTE
R641 390
R627 1K
R625 1K
R626 1K
R624 1K
R623 4.7K
R643 4.7K
R648 150
R640 4.7K
CAP REV TIMER CLK TIMER DATA SERVO PAUSE DUTY I/O LOCK DET SYNC DET S DATA S/M/P CLK PLL DATA D MUTE M CE M DATA TUNER CTL TNR/SC/AUX HiFi/MIX/NOR L/ST/R AUDIO REC FULL ERASE DATA AUX AUDIO REC ST EE POWER ON FE CTL AUDIO MUTE PICTURE MUTE DOC SP VIDEO REC START HiFi REC START
VCC VREF LCM 1 LCM 2 AVRG FM R PAUSE IN THERM MODE SENS 2 MODE SENS 1 MODE SENS 3 REC SAFETY START SENS DRUM CTL V CAP CTL V CASS SENS END SENS DRUM FF CTL PULSE V UP V PULSE A/M/S FADE PREROL REEL FG(SUP) REEL FG(TU) CAP FG CN Vss RESET X IN X OUT ø Vss
C609 2.7P
To 03 MAIN(VIDEO) (Page 3-36)
AUX MV7
P. SHARPNESS MV5
PICTURE MUTE MV8
REC START MV4
FE CTL MV10
EE MV2
AUTO/MAN/SLOW MV6
TP604 SP
SP MV1
REC MV3
FADER MV9
IC603 BA6251
D606
Q604
Q605
RA602 33K X3
R647 33K
R644 4.2K
N MODE 2 N MODE 1 V REC CLK DATA VSS VCC
From/To 09 AUDIO CN2 (Page 3-47)
CN605
FULL ERASE ON REC START HiFi MODE SP REC NORMAL MODE MUTE HiFi REC START
CN606
L CH/ST/R CH HiFi/NORM/MIX DOC POWER ON/OFF AUDIO FF TNR/SC/AUX
From/To 09 AUDIO CN3 (Page 3-47)
Q604,Q605 DTC114ES
5
4
3
2
1
A
B
C

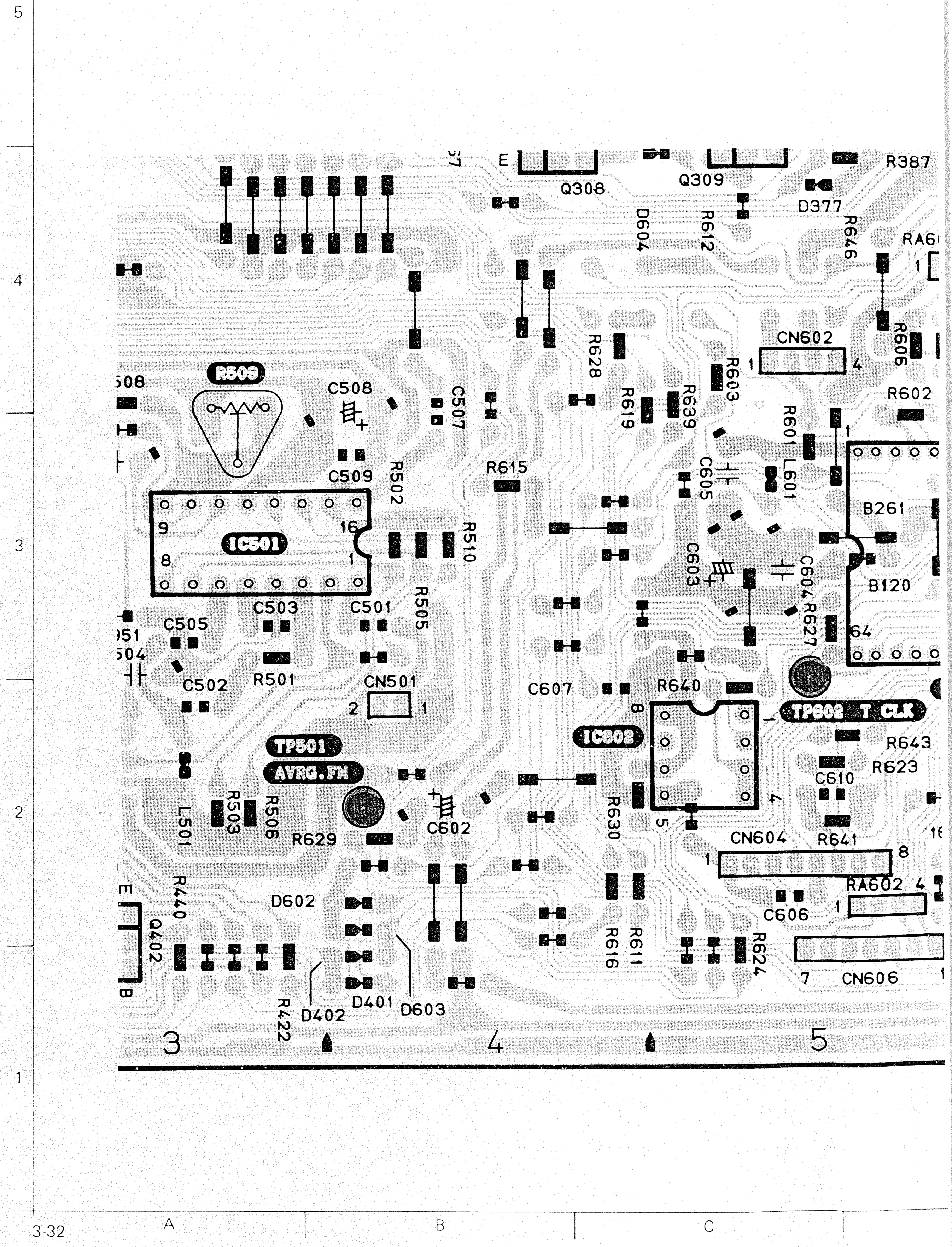

VPT ADAPTOR
EG ONLY
C112 150P
R129 2K
VM1 VPT VIDEO
From 0 3 MAIN(VIDEO) (Page 3-36)
TP601 T DATA
CN101
1 S CLOCK
2 S DATA
3 REMOTE
4 VPS VIDEO
5 GND
EG ONLY
From/To 0 6 TERMINAL CN1 (Page 3-60)
From/To 2 0 TIMER CN1 (Page 3-56)
CN603
1 S CLOCK
2 S DATA
3 REMOTE
4 SC
5 NC
6 UNSW 12V
7 SWD 5V
8 UNSW 5.8V
9 GND
10 TIMER CLK
11 TIMER DATA
12 CNT PULSE
13 P SHAPNESS
4.8 (4.7)0 4.9 10.7 0 12.3 5.1 5.8 0 4.7 4.3 (2.8)0.3 (2.2)2.0
C603 3.3/25
C604 0.022
RA601 10K X4
C605 0.1
C607 120P
R639 10K
R646 10K
R632 56K
R633 33K
R634 150K
R635 220K
R636 30K
L601 2.2
D605
From/To 5 5 MDA CN1 (Page 3-31)
CN602
1 MOTOR 12V
2 LCM1
3 GND(M)
4 LCM2
12.8 0 0 0
From/To 5 1 DECK TERMINAL CN1(Page 3–27)
CN601
1 START SENS
2 CASS SENS
3 GND
4 MODE SENS B
5 REEL FG(TU)
6 SWD 5V
7 REC SAFETY
8 MODE SENS A
9 END SENS
10 GND(M)
11 CAP REV
12 CAP DRIVE
13 CAP FG
14 MOTOR 12V/17V
15 REEL FG(SUP)
16 THERM
17 MODE SENS C
4.6 0.1 0 0 5.1 0 0 5.0 0 3.2 1.4 2.6 11.8 2.7 5.0
601
7419M8–121SP
VCC 1 5.0
VREF 2 5.0
LCM 1 3 0 R601 3.3K
LCM 2 4 0 R602 3.3K
AVRG FM 5 0.2(3.3) R603 1K
R PAUSE IN 6 0 R604 4.7K
THERM 7 2.7 R605 1K
MODE SENS 2 8 0 R606 4.7K
MODE SENS 1 9 0 R607 4.7K
MODE SENS 3 10 5.0 R608 4.7K
REC SAFETY 11 0 R609 4.7K
START SENS 12 4.6 R610 4.7K
DRUM CTL V 13 2.6 R611 10K
CAP CTL V 14 1.4 R612 4.7K
CASS SENS 15 0 R613 4.7K
END SENS 16 5.0 R614 4.7K
DRUM FF 17 2.8 R615 4.7K
CTL PULSE 18 5.1(2.2)
V UP 19 0
V PULSE 20 0 R616 4.7K
A/M/S 21 4.9
FADE 22 5.0
PREROL 23 0
REEL FG(SUP) 24 R617 4.7K
REEL FG(TU) 25 R618 4.7K
CAP FG 26 2.6 R619 4.7K
CN Vss 27 0
RESET 28 5.2
X IN 29 2.2(0)
X OUT 30 2.3 R620 1M
ø 31 4.9
Vss 32 0 R645 680
EV LK DATA /O ET ET CLK TA CTL C/AUX IX/NOR R REC ERASE REC ST ON MUTE E MUTE REC START C START
B601
R631 10K
Q602 18.1 0.4 0
Q603 0 0
R637 1.5K
R638 4.7K
Q601 12.0 18.1 18.1
D610 11E2
TH801 1
CP601 ICP-F25
R621 10K
C601 1/50
R622 4.7K
C608 330/16
D601 HZS7.5EB2
CF601 4MHz
C609 2.7P
Q603 DTC144ES
Q602 DTC114ES
Q601 2SB1425(EU)
IC604 M50253P
9 10 11 12 13 14 15
VCC 16 5.0
E 2 E 1
SWD 5V
JP1
3 SC
11 UNSW 12V
To 0 6 TERMINAL JP1 (Page 3-60)
RM4 UNSW 12V
RM7 MOTOR 17V
RM2 UNSW 5.8V
RM3 SWD 5V
RM6 GND
RM1 MOTOR 12V
RM5 GND(M)
MR1 POWER ON/OFF
From/To 0 3 MAIN(REGULATOR) (Page 3–18)

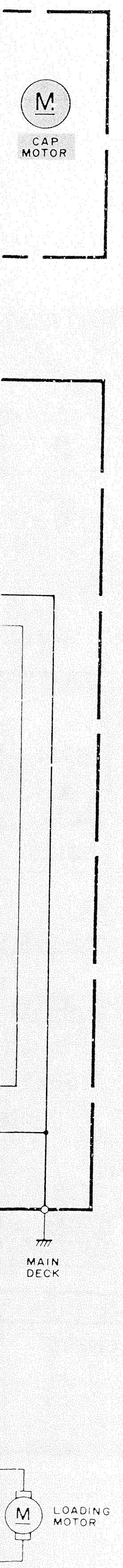
E F G H

3.16 DECK TERMINAL, MODE MOTOR, CAPSTAN MDA AND CASS HOUSING SCHEMATIC DIAGRAMS


5 6 CASS HOUSING
Q2
START
SENSOR
PN268VI-NC
PHS3
C1
0.01
CN2
START SENS
GND
MOTOR 12V
CASS SENS
CN3
5 7 CAP MDA
M
CAP
MOTOR
CAP REV
SWD 5V
CAP FG
GND
GND (M)
CAP DRIVE
MOTOR 12V/17V
CN2
BY MECHANISM
S3
SLIDE SW
R7
2K
R1
2K
CN1
START SENS
CASS SENS
GND
MODE SENS B
REEL FG (TU)
SWD 5V
REC SAFETY
MODE SENS A
END SENS
GND (M)
CAP REV
CAP DRIVE
CAP FG
MOTOR 12V/17V
REEL FG (SUP)
THERM
MODE SENS C
From/To 0 3
MAIN (MECHACON)
CN601
(Page 3-30)
R8
47K
5 1
DECK TERMINAL
R5
330
R4
330
R3
330
Q1
C1
0.01
S2
AMP
D1
AMP
SUPPLY
TURNTABLE
PS2
TAKE UP
TURNTABLE
PS1
Q1
END
SENSOR
S2
REC
SAFETY
MAIN
DECK
5 5 LOADING MDA
CONTROL
LOGIC
IC 1:
BA6418N
CN1
MOTOR 12V
LCM 1
GND (M)
LCM 2
From/To 0 3
MAIN (MECHACON)
CN602
(Page 3-30)
C1
33/16
M
LOADING
MOTOR
5
4
3
2
1
A
B
C

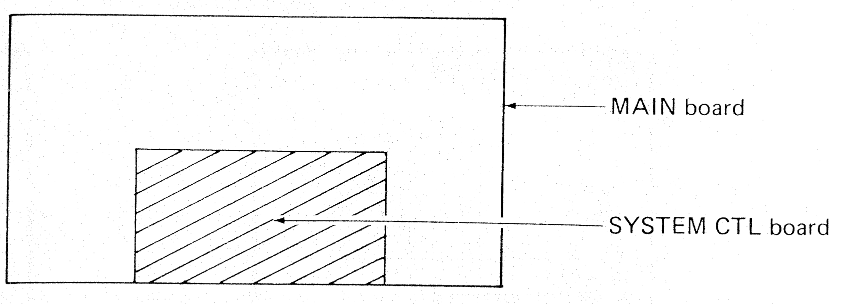
3.17 SYSTEM CTL (MAIN) CIRCUIT BOARD

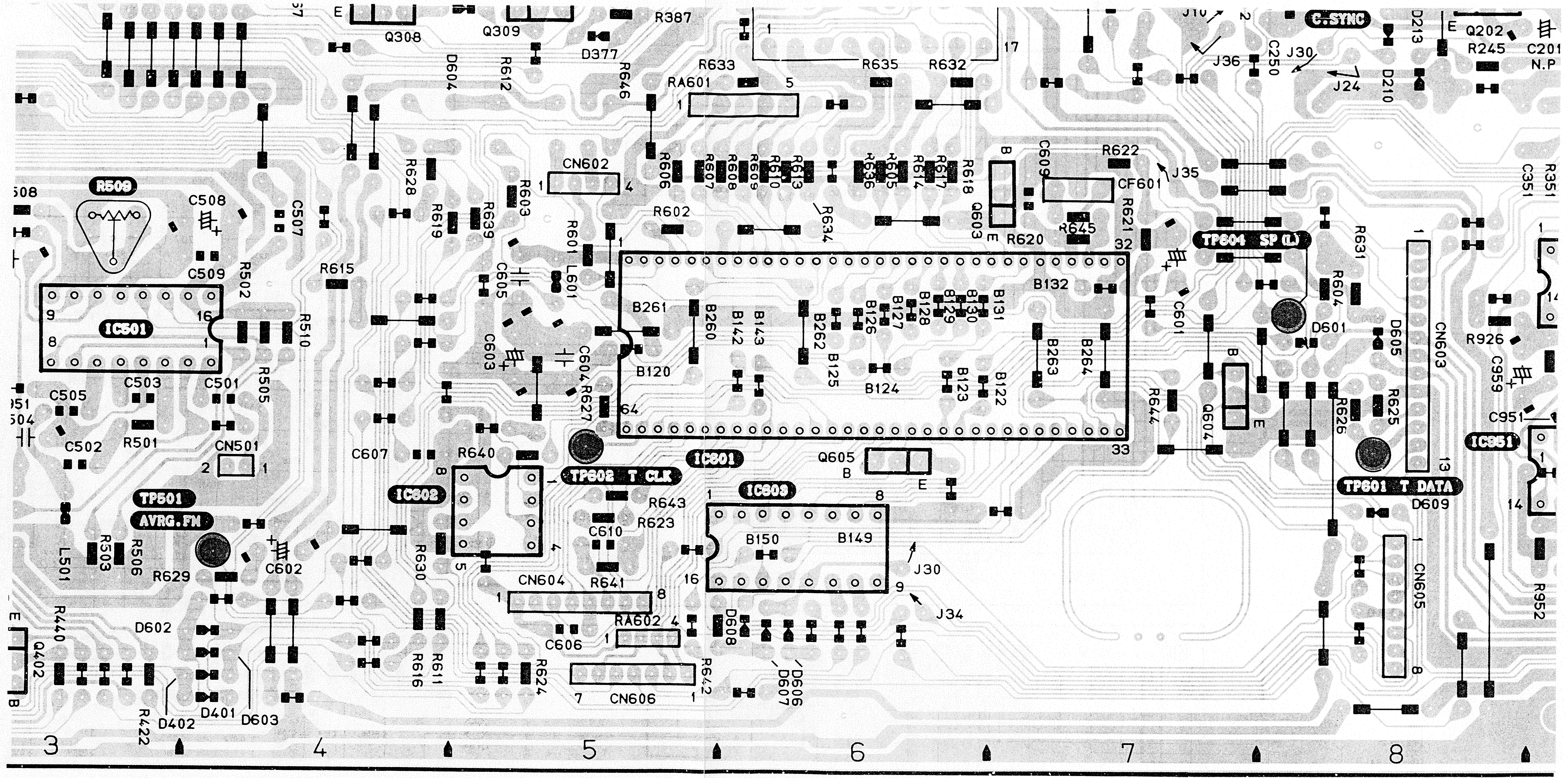

5
4
3
2
1
E
Q308
Q309
R387
D377
D604
R612
R646
RA6
CN602
R628
R603
R606
R509
C508
C507
R619
R639
R602
508
R601
L601
C509
R502
R615
C605
B261
IC501
R510
C603
C604
R627
B120
9
16
8
1
C505
C503
C501
R505
C502
R501
CN501
2
1
C607
R640
TP602 T CLK
IC602
R643
TP501
AVRG.FM
C610
R623
R503
R506
R629
C602
R630
L501
CN604
R641
R440
Q402
D602
RA602
C606
R616
R611
R624
CN606
R422
D402
D401
D603
3
4
5
A
B
C


M
CAP MOTOR
MAIN DECK
M
LOADING MOTOR

3.17 SYSTEM CTL (MAIN) CIRCUIT BOARD

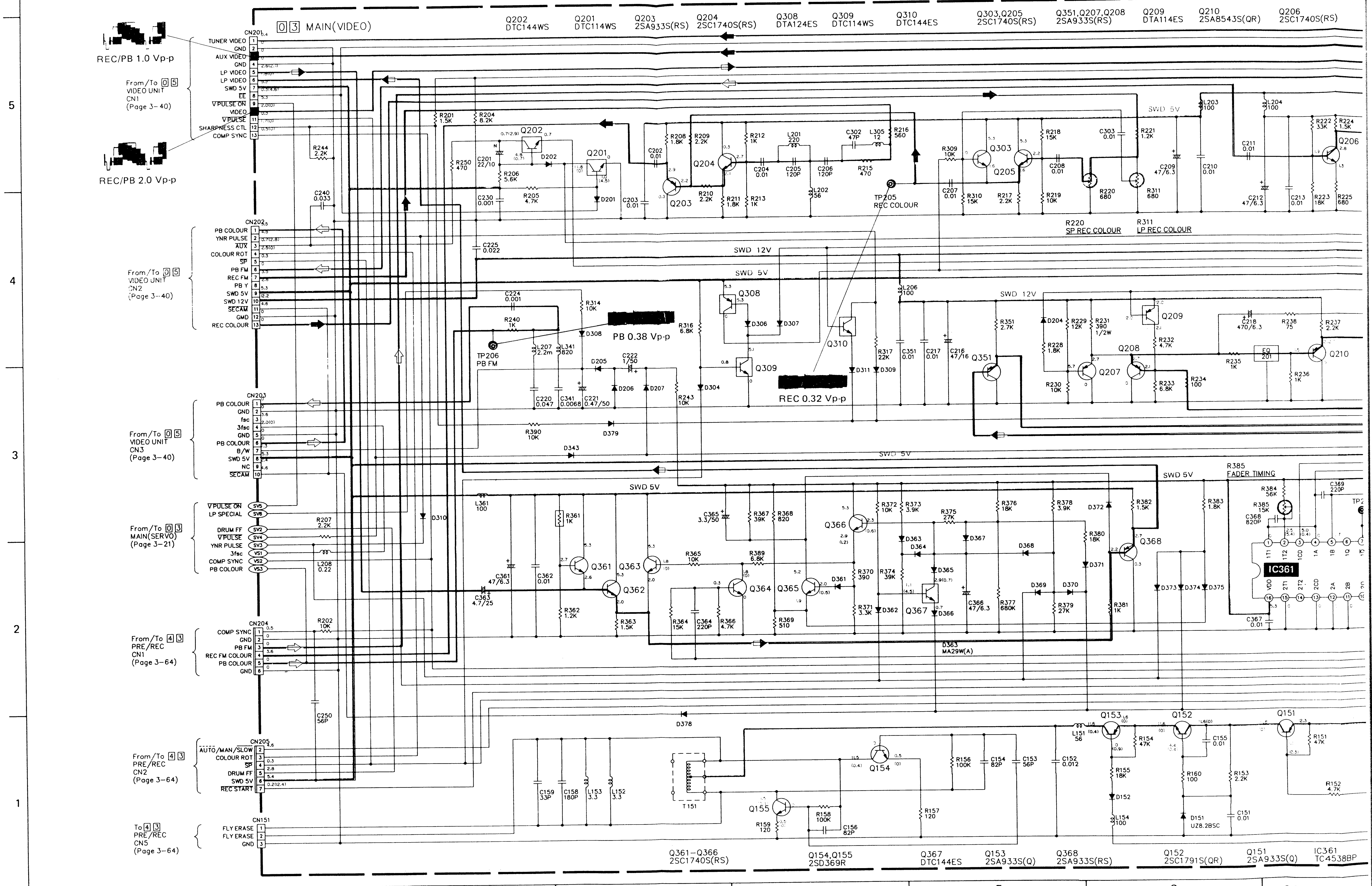
- MAIN board assembly is located in page 3-67, 68


MAIN board
SYSTEM CTL board

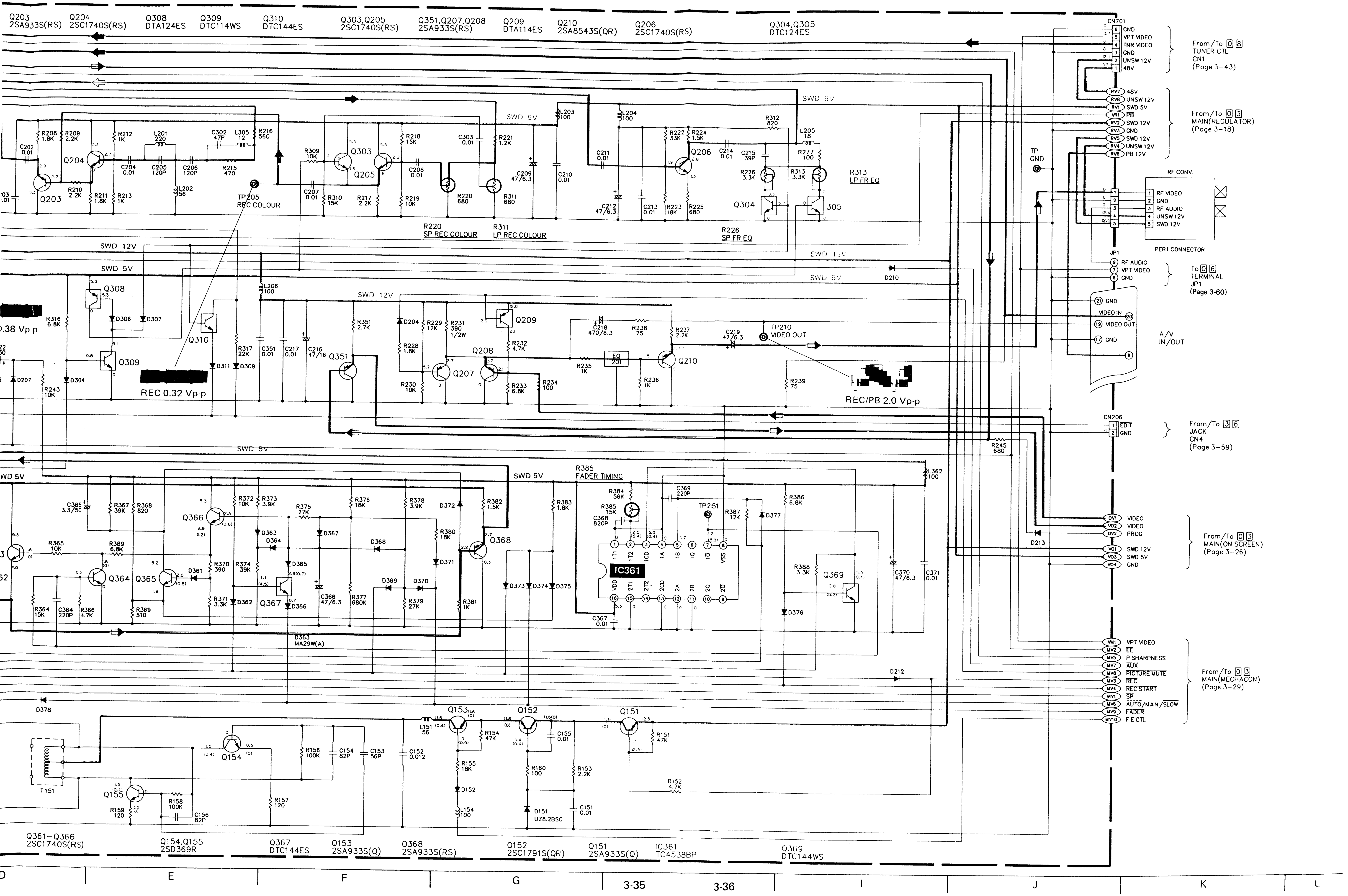

Q308
Q309
R387
D377
D604
R612
R646
R633
RA601
R635
R632
J10
J36
C250
C.SYNC
J30
J24
D213
D210
Q202
R245
C201
N.P
CN602
R628
R619
R639
R603
R606
R607
R608
R609
R610
R613
R636
R605
R614
R617
R618
C609
Q603
R622
CF601
J35
R621
R620
R645
R602
R634
R601
L601
R615
C605
R508
R509
C508
C507
C509
R502
IC501
R510
R505
C503
C501
C505
C502
R501
CN501
TP501
AVRG.FM
R503
R506
L501
R629
C602
R440
D602
Q402
R422
D402
D401
D603
C607
R640
IC602
R630
C603
C604
R627
TP602 T CLK
IC601
B261
B260
B142
B143
B262
B126
B127
B128
B129
B130
B131
B132
B125
B124
B123
B122
B263
B264
B120
IC603
B150
B149
R643
R623
C610
R641
CN604
RA602
C606
R616
R611
R624
D608
R642
D606
D607
CN606
Q605
J30
J34
TP604 SP (L)
C601
D601
R604
R631
D605
CN603
R926
C959
C951
IC951
R644
Q604
R626
R625
TP601 T DATA
D609
CN605
R952
C351
R351
3
4
5
6
7
8

6
5
4
3
2
1
A
B
C
D
E
F
G

3.18 VIDEO SCHEMATIC DIAGRAM

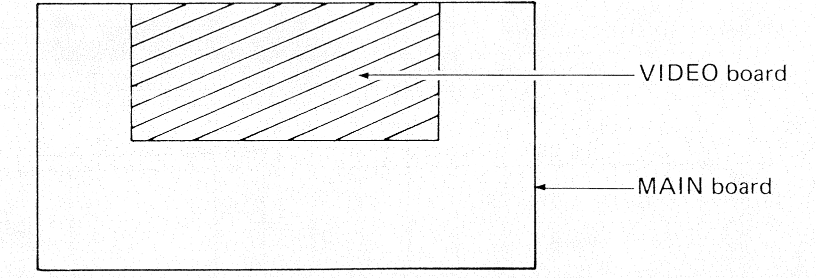


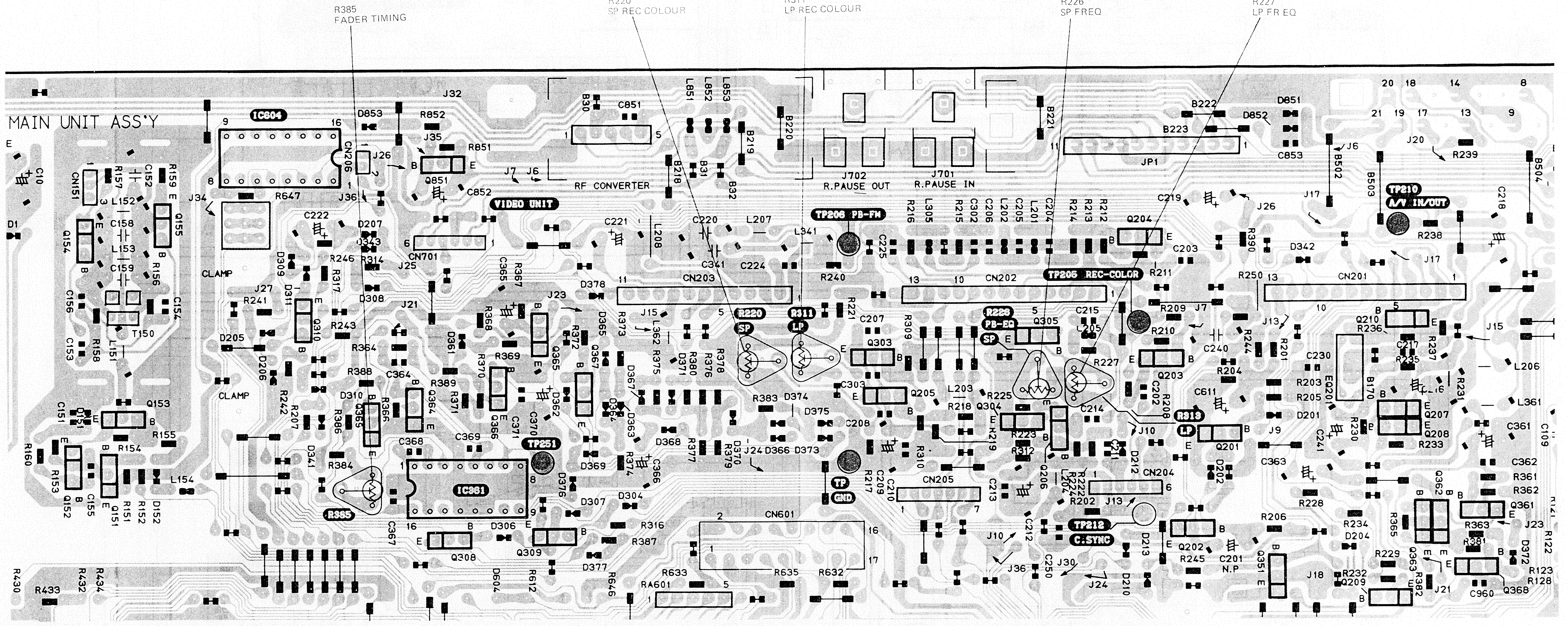
REC/PB 1.0 Vp-p
REC/PB 2.0 Vp-p
03 MAIN(VIDEO)
Q202 DTC144WS
Q201 DTC114WS
Q203 2SA933S(RS)
Q204 2SC1740S(RS)
Q308 DTA124ES
Q309 DTC114WS
Q310 DTC144ES
Q303,Q205 2SC1740S(RS)
Q351,Q207,Q208 2SA933S(RS)
Q209 DTA114ES
Q210 2SA8543S(QR)
Q206 2SC1740S(RS)
CN201
TUNER VIDEO
GND
AUX VIDEO
GND
LP VIDEO
LP VIDEO
SWD 5V
EE
V PULSE ON
VIDEO
V PULSE
SHARPNESS CTL
COMP SYNC
From/To 05 VIDEO UNIT CN1 (Page 3-40)
CN202
PB COLOUR
YNR PULSE
AUX
COLOUR ROT
SP
PB FM
REC FM
PB Y
SWD 5V
SWD 12V
SECAM
GND
REC COLOUR
From/To 05 VIDEO UNIT CN2 (Page 3-40)
CN203
PB COLOUR
GND
fsc
3fsc
GND
PB COLOUR
B/W
SWD 5V
NC
SECAM
From/To 05 VIDEO UNIT CN3 (Page 3-40)
V PULSE ON
LP SPECIAL
DRUM FF
V PULSE
YNR PULSE
3fsc
COMP SYNC
PB COLOUR
SV5
SV6
SV2
SV4
SV3
VS1
VS2
VS3
From/To 03 MAIN(SERVO) (Page 3-21)
CN204
COMP SYNC
GND
PB FM
REC FM COLOUR
PB COLOUR
GND
From/To 43 PRE/REC CN1 (Page 3-64)
CN205
AUTO/MAN/SLOW
COLOUR ROT
SP
DRUM FF
SWD 5V
REC START
From/To 43 PRE/REC CN2 (Page 3-64)
CN151
FLY ERASE
FLY ERASE
GND
To 43 PRE/REC CN5 (Page 3-64)
R201 1.5K
R204 8.2K
R244 2.2K
C240 0.033
R250 470
C201 22/10
R206 5.6K
C230 0.001
R205 4.7K
D202
D201
C203 0.01
C202 0.01
R208 1.8K
R209 2.2K
R210 2.2K
R211 1.8K
R212 1K
R213 1K
L201 220
C204 0.01
C205 120P
C206 120P
L202 56
C302 47P
L305 12
R216 560
R215 470
TP205 REC COLOUR
R309 10K
C207 0.01
R310 15K
R217 2.2K
R218 15K
C208 0.01
R219 10K
C303 0.01
R220 680
R221 1.2K
R311 680
C209 47/6.3
C210 0.01
L203 100
L204 100
C211 0.01
C212 47/6.3
C213 0.01
R222 33K
R223 18K
R224 1.5K
R225 680
R220 SP REC COLOUR
R311 LP REC COLOUR
SWD 5V
SWD 12V
C225 0.022
C224 0.001
R240 1K
R314 10K
D308
PB 0.38 Vp-p
R316 6.8K
TP206 PB FM
L207 2.2m
L341 820
D205
C222 1/50
D206
D207
C220 0.047
C341 0.0068
C221 0.47/50
R243 10K
D304
D306
D307
L206 100
R317 22K
C351 0.01
C217 0.01
C216 47/16
D311
D309
REC 0.32 Vp-p
R351 2.7K
D204
R229 12K
R231 390 1/2W
R228 1.8K
R232 4.7K
R230 10K
R233 6.8K
R234 100
C218 470/6.3
R238 75
R237 2.2K
R235 1K
EQ 201
R236 1K
R390 10K
D379
D343
D310
L361 100
R361 1K
R207 2.2K
L208 0.22
R202 10K
C361 47/6.3
C363 4.7/25
C362 0.01
R362 1.2K
R363 1.5K
C365 3.3/50
R365 10K
R367 39K
R368 820
R389 6.8K
R364 15K
C364 220P
R366 4.7K
R369 510
D361
R370 390
R371 3.3K
R372 10K
R373 3.9K
D363
D364
R374 39K
D362
R375 27K
D367
D365
C366 47/6.3
D366
R376 18K
R377 680K
D368
D369
D370
R378 3.9K
R379 27K
R380 18K
D371
D372
R382 1.5K
R381 1K
D363 MA29W(A)
R383 1.8K
D373
D374
D375
R385 FADER TIMING
R384 56K
R385 15K
C368 820P
C369 220P
IC361
C367 0.01
C250 56P
C240 0.033
D378
C159 33P
C158 180P
L153 3.3
L152 3.3
T151
Q155
R159 120
R158 100K
C156 82P
Q154
R156 100K
C154 82P
C153 56P
R157 120
C152 0.012
L151 56
Q153
R154 47K
R155 18K
D152
L154 100
Q152
C155 0.01
R160 100
R153 2.2K
D151 UZ8.2BSC
C151 0.01
Q151
R151 47K
R152 4.7K
Q361–Q366 2SC1740S(RS)
Q154,Q155 2SD369R
Q367 DTC144ES
Q153 2SA933S(Q)
Q368 2SA933S(RS)
Q152 2SC1791S(QR)
Q151 2SA933S(Q)
IC361 TC4538BP
A
B
C
D
E
F
G
1
2
3
4
5
6


Q203 2SA933S(RS)
Q204 2SC1740S(RS)
Q308 DTA124ES
Q309 DTC114WS
Q310 DTC144ES
Q303,Q205 2SC1740S(RS)
Q351,Q207,Q208 2SA933S(RS)
Q209 DTA114ES
Q210 2SA8543S(QR)
Q206 2SC1740S(RS)
Q304,Q305 DTC124ES
CN701
6 GND
5 VPT VIDEO
4 TNR VIDEO
3 GND
2 UNSW 12V
1 48V
From/To 08 TUNER CTL CN1 (Page 3-43)
RV7 48V
RV8 UNSW 12V
RV1 SWD 5V
VR1 PB
RV2 SWD 12V
RV3 GND
RV5 SWD 12V
RV4 UNSW 12V
RV6 PB 12V
From/To 03 MAIN(REGULATOR) (Page 3-18)
SWD 5V
SWD 12V
TP GND
RF CONV.
1 RF VIDEO
2 GND
3 RF AUDIO
4 UNSW 12V
5 SWD 12V
PER1 CONNECTOR
JP1
9 RF AUDIO
7 VPT VIDEO
6 GND
To 06 TERMINAL JP1 (Page 3-60)
21 GND
VIDEO IN 20
19 VIDEO OUT
17 GND
8
A/V IN/OUT
R208 1.8K
R209 2.2K
R212 1K
L201 220
C302 47P
L305 12
R216 560
C202 0.01
C204 0.01
C205 120P
C206 120P
R215 470
R210 2.2K
R211 1.8K
R213 1K
L202 56
TP205 REC COLOUR
R309 10K
R218 15K
C303 0.01
R221 1.2K
C208 0.01
C207 0.01
R310 15K
R217 2.2K
R219 10K
R220 680
R311 680
C209 47/6.3
C210 0.01
L203 100
L204 100
R220 SP REC COLOUR
R311 LP REC COLOUR
C211 0.01
C212 47/6.3
C213 0.01
R222 33K
R224 1.5K
R223 18K
R225 680
C214 0.01
C215 39P
R312 820
L205 18
R277 100
R226 3.3K
R313 3.3K
R313 LP FR EQ
R226 SP FR EQ
Q304
305
D210
SWD 12V
SWD 5V
Q308
D306
D307
R316 6.8K
0.38 Vp-p
Q310
Q309
D207
D304
R243 10K
D311
D309
REC 0.32 Vp-p
L206 100
R317 22K
C351 0.01
C217 0.01
C216 47/16
Q351
R351 2.7K
D204
R229 12K
R231 390 1/2W
R228 1.8K
R230 10K
Q207
Q208
Q209
R232 4.7K
R233 6.8K
R234 100
C218 470/6.3
R238 75
R237 2.2K
EQ 201
R235 1K
R236 1K
Q210
C219 47/6.3
TP210 VIDEO OUT
R239 75
REC/PB 2.0 Vp-p
CN206
1 EDIT
2 GND
From/To 36 JACK CN4 (Page 3-59)
R245 680
WD 5V
SWD 5V
R385 FADER TIMING
L362 100
R384 56K
R385 15K
C368 820P
C369 220P
TP251
R387 12K
D377
R386 6.8K
IC361
C365 3.3/50
R367 39K
R368 820
Q366
R372 10K
R373 3.9K
R375 27K
R376 18K
R378 3.9K
D372
R382 1.5K
R383 1.8K
R380 18K
Q368
D363
D364
D367
D368
D365
D371
R365 10K
R389 6.8K
Q364
Q365
D361
R370 390
R374 39K
Q367
C366 47/6.3
R377 680K
D369
D370
R379 27K
R381 1K
D373
D374
D375
R364 15K
C364 220P
R366 4.7K
R369 510
R371 3.3K
D362
D366
C367 0.01
R388 3.3K
Q369
C370 47/6.3
C371 0.01
D376
D213
OV1 VIDEO
VO2 VIDEO
OV2 PROG
VO1 SWD 12V
VO3 SWD 5V
VO4 GND
From/To 03 MAIN(ON SCREEN) (Page 3-26)
D363 MA29W(A)
D212
D378
VM1 VPT VIDEO
MV2 EE
MV5 P SHARPNESS
MV7 AUX
MV8 PICTURE MUTE
MV3 REC
MV4 REC START
MV1 SP
MV6 AUTO/MAN/SLOW
MV9 FADER
MV10 F.E CTL
From/To 03 MAIN(MECHACON) (Page 3-29)
T151
Q154
R156 100K
C154 82P
C153 56P
C152 0.012
L151 56
Q153
R154 47K
Q152
C155 0.01
Q151
R151 47K
Q155
R158 100K
C156 82P
R159 120
R157 120
R155 18K
D152
L154 100
R160 100
R153 2.2K
D151 UZ8.2BSC
C151 0.01
R152 4.7K
Q361-Q366 2SC1740S(RS)
Q154,Q155 2SD369R
Q367 DTC144ES
Q153 2SA933S(Q)
Q368 2SA933S(RS)
Q152 2SC1791S(QR)
Q151 2SA933S(Q)
IC361 TC4538BP
Q369 DTC144WS
D
E
F
G
I
J
K
L

3.19 VIDEO (MAIN) CIRCUIT BOARD

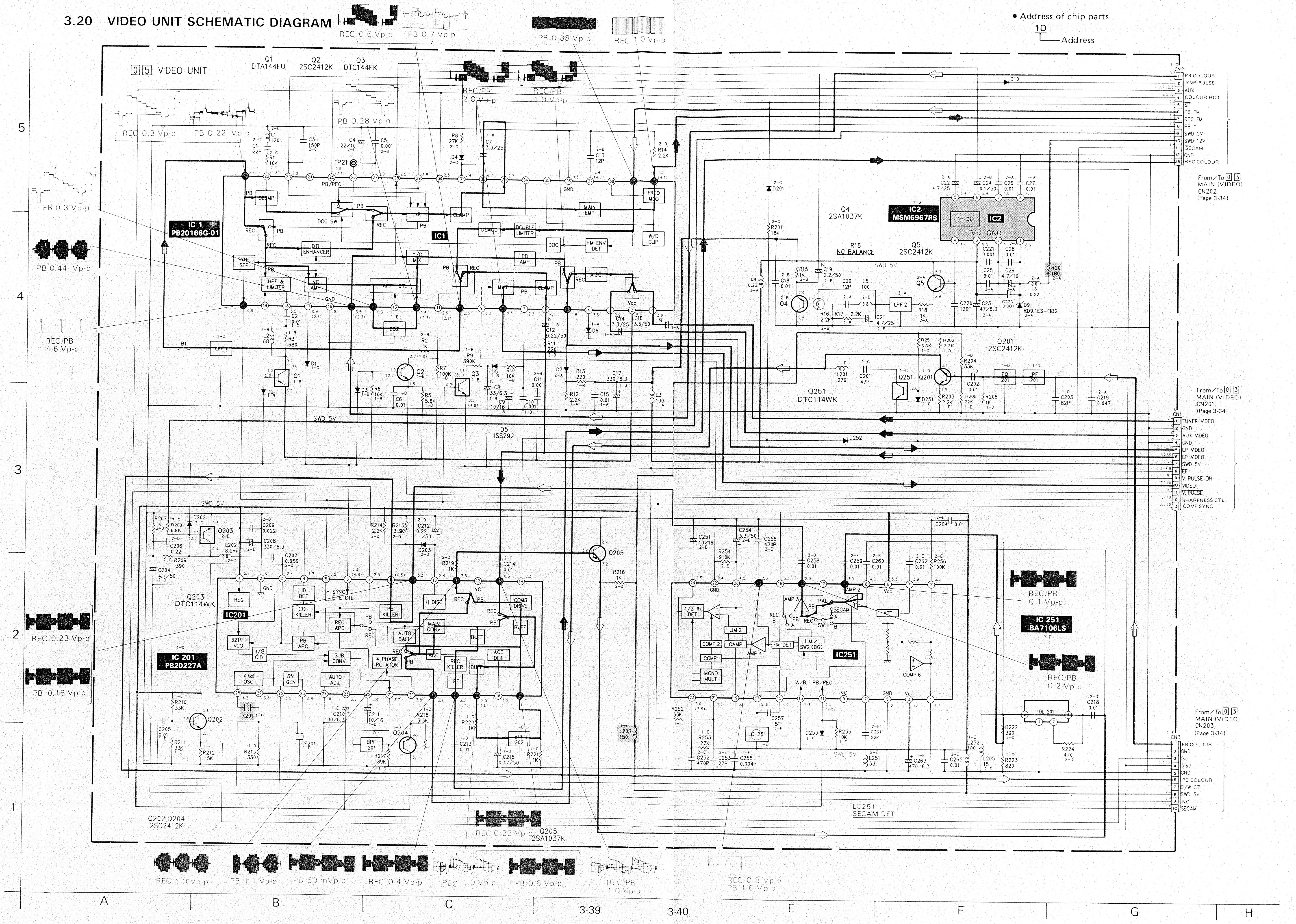
- MAIN board assembly is located in page 3-67, 68


VIDEO board
MAIN board

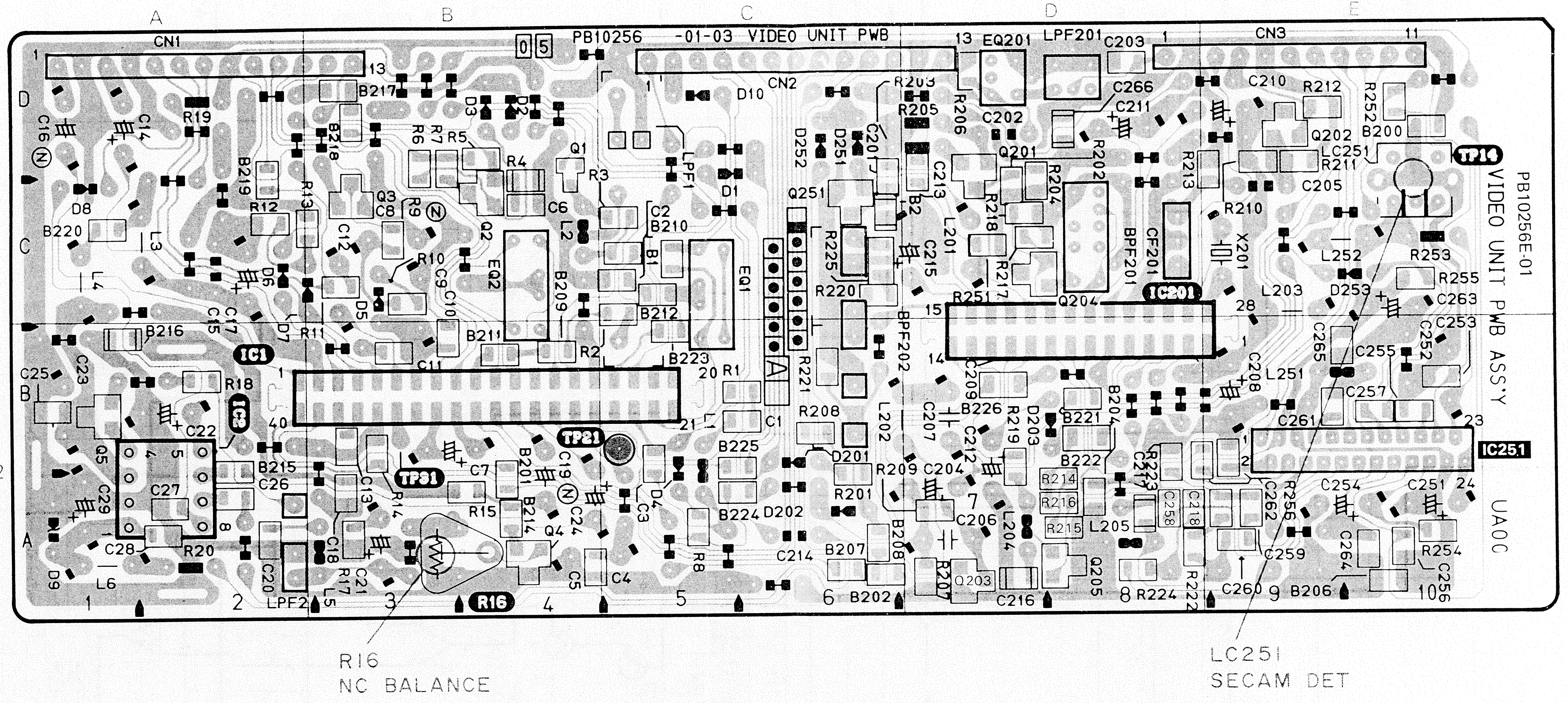

R385
FADER TIMING
R220
SP REC COLOUR
R311
LP REC COLOUR
R226
SP FREQ
R227
LP FR EQ
MAIN UNIT ASS'Y
IC604
IC361
VIDEO UNIT
RF CONVERTER
J702
R.PAUSE OUT
J701
R.PAUSE IN
JP1
CN201
CN202
CN203
CN204
CN205
CN206
CN601
CN701
CLAMP
TP206 PB-FM
TP205 REC-COLOR
TP210 A/V IN/OUT
TP251
TP GND
TP212
C.SYNC
R220 SP
R311 LP
R226 SP
R228 PB-EQ
R313 LP
R385
T150
Q851
Q153
Q152
Q151
Q154
Q155
Q201
Q202
Q203
Q204
Q205
Q206
Q207
Q208
Q209
Q210
Q303
Q304
Q305
Q308
Q309
Q310
Q351
Q361
Q362
Q363
Q364
Q365
Q366
Q367
Q368
RA601
C201 N.P

3.20 VIDEO UNIT SCHEMATIC DIAGRAM

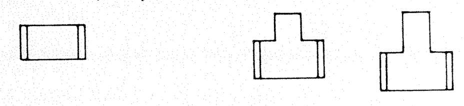
● Address of chip parts
1D
└─Address


05 VIDEO UNIT
Q1 DTA144EU
Q2 2SC2412K
Q3 DTC144EK
REC 0.6 Vp-p
PB 0.7 Vp-p
PB 0.38 Vp-p
REC 1.0 Vp-p
REC/PB 2.0 Vp-p
REC/PB 1.0 Vp-p
PB 0.28 Vp-p
REC 0.3 Vp-p
PB 0.22 Vp-p
PB 0.3 Vp-p
PB 0.44 Vp-p
REC/PB 4.6 Vp-p
IC 1 PB20166G-01
IC1
SYNC SEP
HPF & LIMITER
NC AMP
DTL ENHANCER
DEEMP
DOC SW
NR
CLAMP
DEMOD
DOUBLE LIMITER
MAIN EMP
FREQ MOD
W/D CLIP
DOC
FM ENV DET
Y/C MIX
PB AMP
APT CTL
EQ2
MIX
AGC
LPF 1
TP21
PB/REC
GND
SWD 5V
D5 ISS292
Q4 2SA1037K
R16 NC BALANCE
Q5 2SC2412K
IC2 MSM6967RS
1H DL
Vcc GND
LPF 2
Q201 2SC2412K
Q251 DTC114WK
EQ 201
LPF 201
D10
D252
CN2
PB COLOUR
YNR PULSE
AUX
COLOUR ROT
SP
PB FM
REC FM
PB Y
SWD 5V
SWD 12V
SECAM
GND
REC COLOUR
From/To 03 MAIN (VIDEO) CN202 (Page 3-34)
CN1
TUNER VIDEO
GND
AUX VIDEO
GND
LP VIDEO
LP VIDEO
SWD 5V
EE
V. PULSE ON
VIDEO
V. PULSE
SHARPNESS CTL
COMP SYNC
From/To 03 MAIN (VIDEO) CN201 (Page 3-34)
Q203 DTC114WK
IC201
IC 201 PB20227A
REG
ID DET
H SYNC E-E CTL
H DISC
COL KILLER
REC APC
PB APC
321FH VCO
1/8 C.D.
SUB CONV
X'tal OSC
3fc GEN
AUTO ADJ.
PB KILLER
AUTO BALL
MAIN CONV
4 PHASE ROTATOR
ACC
REC KILLER
LPF
BUFF
ACC DET
COMB DRIVE
BPF 201
BPF 202
Q205
Q202,Q204 2SC2412K
Q205 2SA1037K
REC 0.23 Vp-p
PB 0.16 Vp-p
REC 0.22 Vp-p
REC 1.0 Vp-p
PB 1.1 Vp-p
PB 50 mVp-p
REC 0.4 Vp-p
REC 1.0 Vp-p
PB 0.6 Vp-p
REC/PB 1.0 Vp-p
REC 0.8 Vp-p
PB 1.0 Vp-p
IC251
IC 251 BA7106LS
1/2 fH DET
LIM 2
COMP 2
CAMP
COMP1
MONO MULTI
AMP 3
AMP 4
FM DET
LIMI/ SW2 (BG)
AMP 2
PAL
SECAM
SW 1
ATT
COMP 6
A/B
PB/REC
REC/PB 0.1 Vp-p
REC/PB 0.2 Vp-p
DL 201
LC 251
LC251 SECAM DET
CN3
PB COLOUR
GND
fsc
3fsc
GND
PB COLOUR
B/W CTL
SWD 5V
NC
SECAM
From/To 03 MAIN (VIDEO) CN203 (Page 3-34)
A
B
C
D
E
F
G
H
1
2
3
4
5

3.21 VIDEO UNIT CIRCUIT BOARD


PB10256 -01-03 VIDEO UNIT PWB
PB10256E-01
VIDEO UNIT PWB ASS'Y
UA0C
CN1
CN2
CN3
IC1
IC2
IC201
IC251
TP14
TP21
TP31
R16
EQ1
EQ2
EQ201
LPF1
LPF2
LPF201
BPF201
BPF202
CF201
X201
R16
NC BALANCE
LC251
SECAM DET

Note: Double edging indicates not used in this model.
Examples ; Resistor, Capacitor, Transistor, DIODE

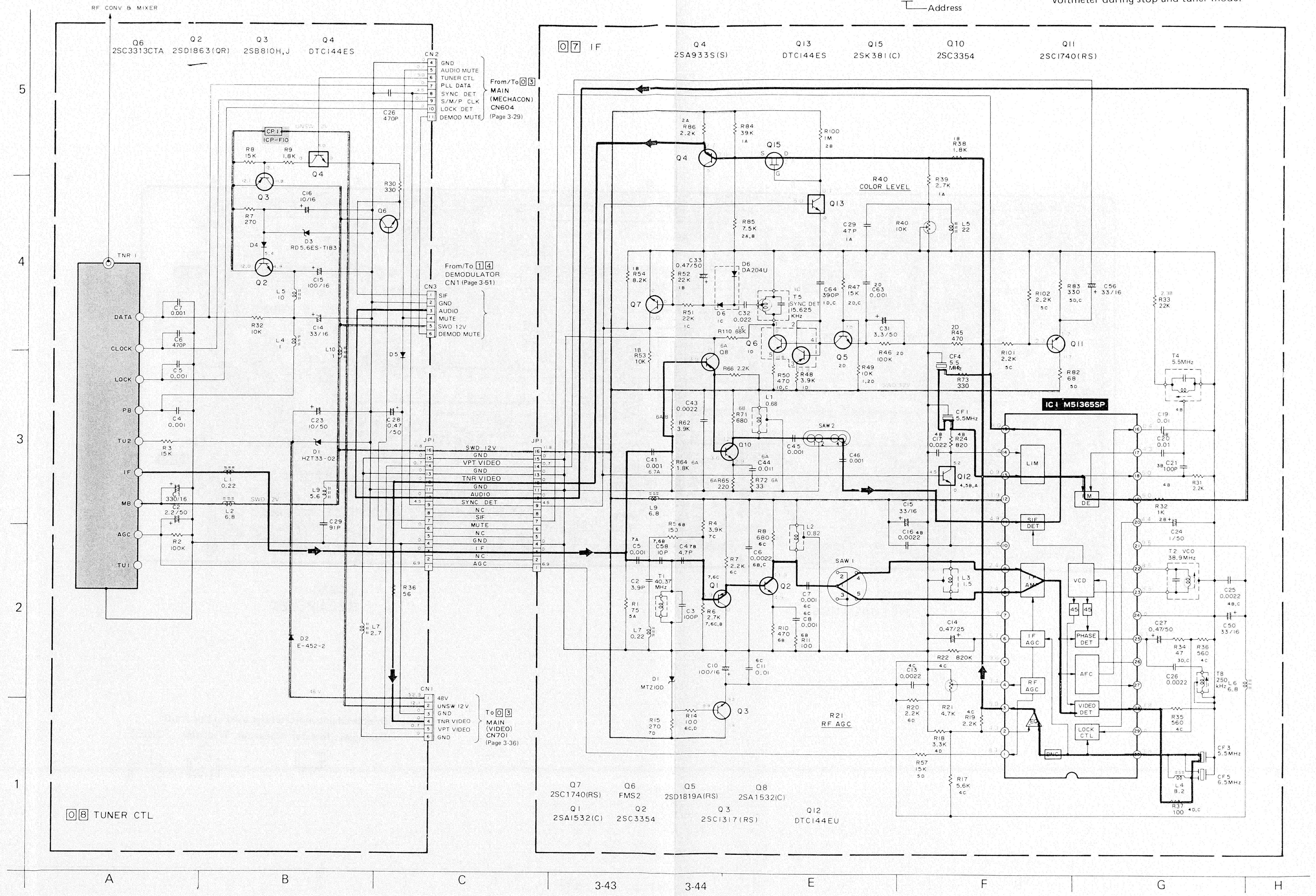


3.22 IF & TUNER CTL SCHEMATIC DIAGRAMS

- Address of chip parts

1D
└─Address

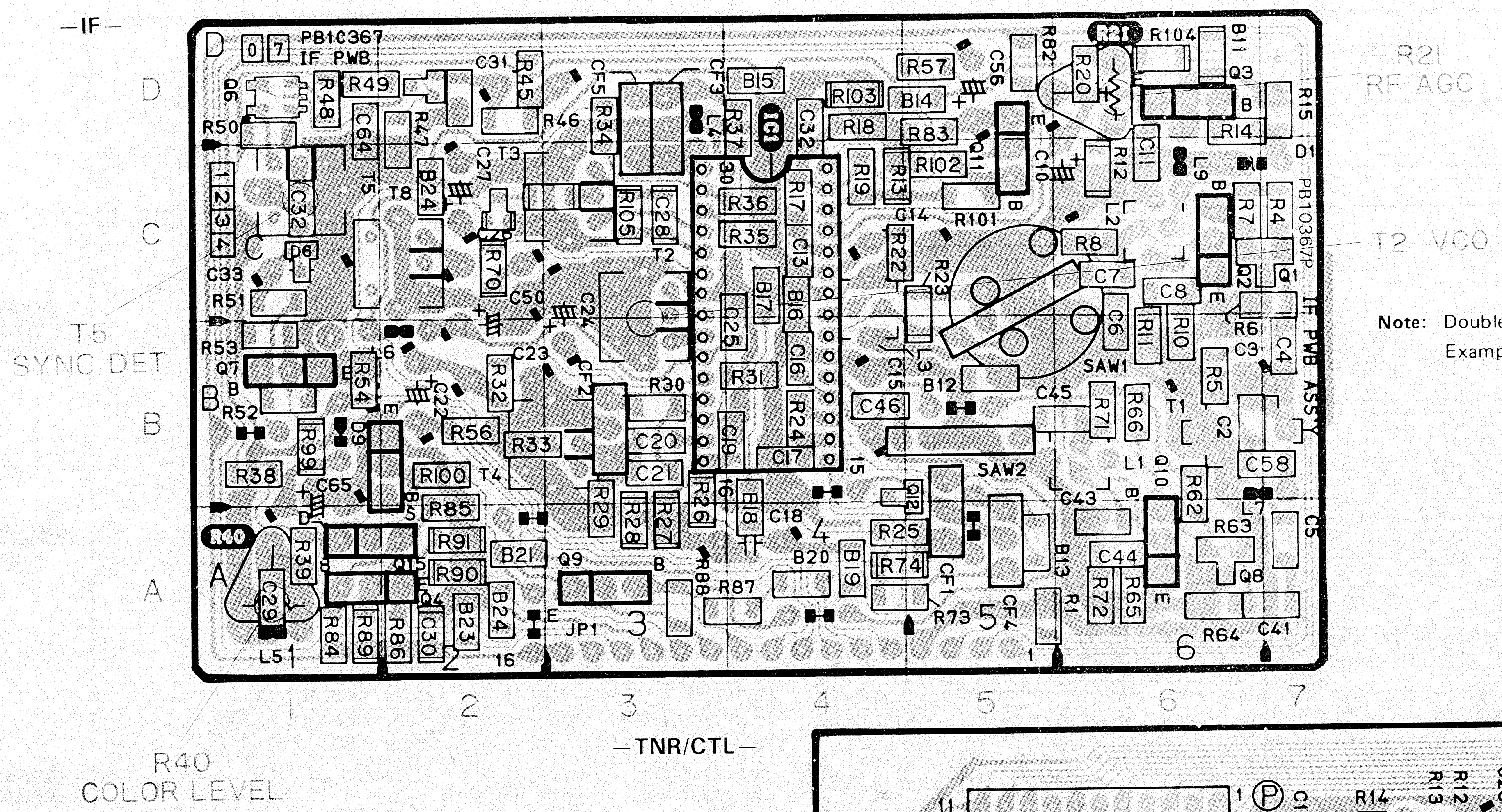
NOTE: Voltages are DC-measured with a digital voltmeter during stop and tuner mode.



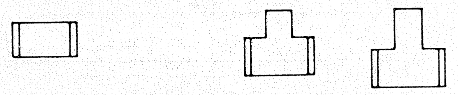
RF CONV & MIXER
Q6 2SC3313CTA
Q2 2SD1863(QR)
Q3 2SB810H,J
Q4 DTC144ES
CN2
GND
AUDIO MUTE
TUNER CTL
PLL DATA
SYNC DET
S/M/P CLK
LOCK DET
DEMOD MUTE
From/To 03 MAIN (MECHACON) CN604 (Page 3-29)
C26 470P
CP1 ICP-F10
R8 15K
R9 1.8K
Q4
Q3
C16 10/16
R30 330
R7 270
Q6
D3 RD5.6ES-T1B3
D4
Q2
C15 100/16
TNR 1
DATA
CLOCK
LOCK
PB
TU2
IF
MB
AGC
TU1
C7 0.001
C6 470P
C5 0.001
C4 0.001
R3 15K
L1 0.22
C1 330/16
C2 2.2/50
L2 6.8
R2 100K
R32 10K
L5 10
C14 33/16
L4 1
L10 1
D5
From/To 14 DEMODULATOR CN1 (Page 3-51)
CN3
SIF
GND
AUDIO
MUTE
SWD 12V
DEMOD MUTE
C23 10/50
C28 0.47/50
D1 HZT33-02
L9 5.6
C29 91P
SWD 12V
JP1
SWD 12V
GND
VPT VIDEO
GND
TNR VIDEO
GND
AUDIO
SYNC DET
NC
SIF
MUTE
NC
GND
IF
NC
AGC
R36 56
L7 2.7
D2 E-452-2
CN1
48V
UNSW 12V
GND
TNR VIDEO
VPT VIDEO
GND
To 03 MAIN (VIDEO) CN701 (Page 3-36)
08 TUNER CTL
07 IF
Q4 2SA933S(S)
Q13 DTC144ES
Q15 2SK381(C)
Q10 2SC3354
Q11 2SC1740(RS)
R86 2.2K
R84 39K
R100 1M
Q15
Q4
R38 1.8K
R40 COLOR LEVEL
R39 2.7K
Q13
R85 7.5K
C29 47P
R40 10K
L5 22
R54 8.2K
C33 0.47/50
R52 22K
D6 DA204U
Q7
R51 22K
C32 0.022
T5 SYNC DET 15.625 KHz
C64 390P
R47 15K
C63 0.001
R102 2.2K
R83 330
C56 33/16
R33 22K
R110 68K
Q6
Q5
C31 3.3/50
R45 470
Q11
R53 10K
Q8
R66 2.2K
R50 470
R48 3.9K
R49 10K
R46 100K
CF4 5.5 MHz
R101 2.2K
R73 330
R82 68
T4 5.5MHz
C43 0.0022
R71 680
L1 0.68
IC1 M51365SP
CF1 5.5MHz
C19 0.01
R62 3.9K
SAW 2
C17 0.022
R24 820
C20 0.01
C41 0.001
R64 1.8K
Q10
C45 0.001
C44 0.011
C46 0.001
Q12
LIM
C21 100P
R31 2.2K
R65 220
R72 33
FM DE
L9 6.8
C15 33/16
C16 0.0022
SIF DET
R32 1K
C24 1/50
R5 150
R4 3.9K
R8 680
L2 0.82
C5 0.001
C58 10P
C47 4.7P
C6 0.0022
T2 VCO 38.9MHz
SAW 1
C2 3.9P
T1 40.37 MHz
R7 2.2K
Q1
Q2
L3 1.5
IF AMP
VCO
C25 0.0022
R1 75
C3 100P
R6 2.7K
C7 0.001
C8 0.001
C14 0.47/25
45
PHASE DET
C27 0.47/50
C50 33/16
L7 0.22
R10 470
R11 100
IF AGC
R22 820K
R34 47
R36 560
C10 100/16
C11 0.01
C13 0.0022
AFC
C26 0.0022
T8 250 kHz
L6 6.8
D1 MTZ10D
RF AGC
Q3
R20 2.2K
R21 4.7K
R19 2.2K
VIDEO DET
R35 560
R15 270
R14 100
R21 RF AGC
EQ
LOCK CTL
R18 3.3K
ANC
CF3 5.5MHz
R57 15K
R17 5.6K
L4 8.2
CF5 6.5MHz
R37 100
Q7 2SC1740(RS)
Q6 FMS2
Q5 2SD1819A(RS)
Q8 2SA1532(C)
Q1 2SA1532(C)
Q2 2SC3354
Q3 2SC1317(RS)
Q12 DTC144EU
5
4
3
2
1
A
B
C
E
F
G
H

3.23 IF & TUNER CTL CIRCUIT BOARDS

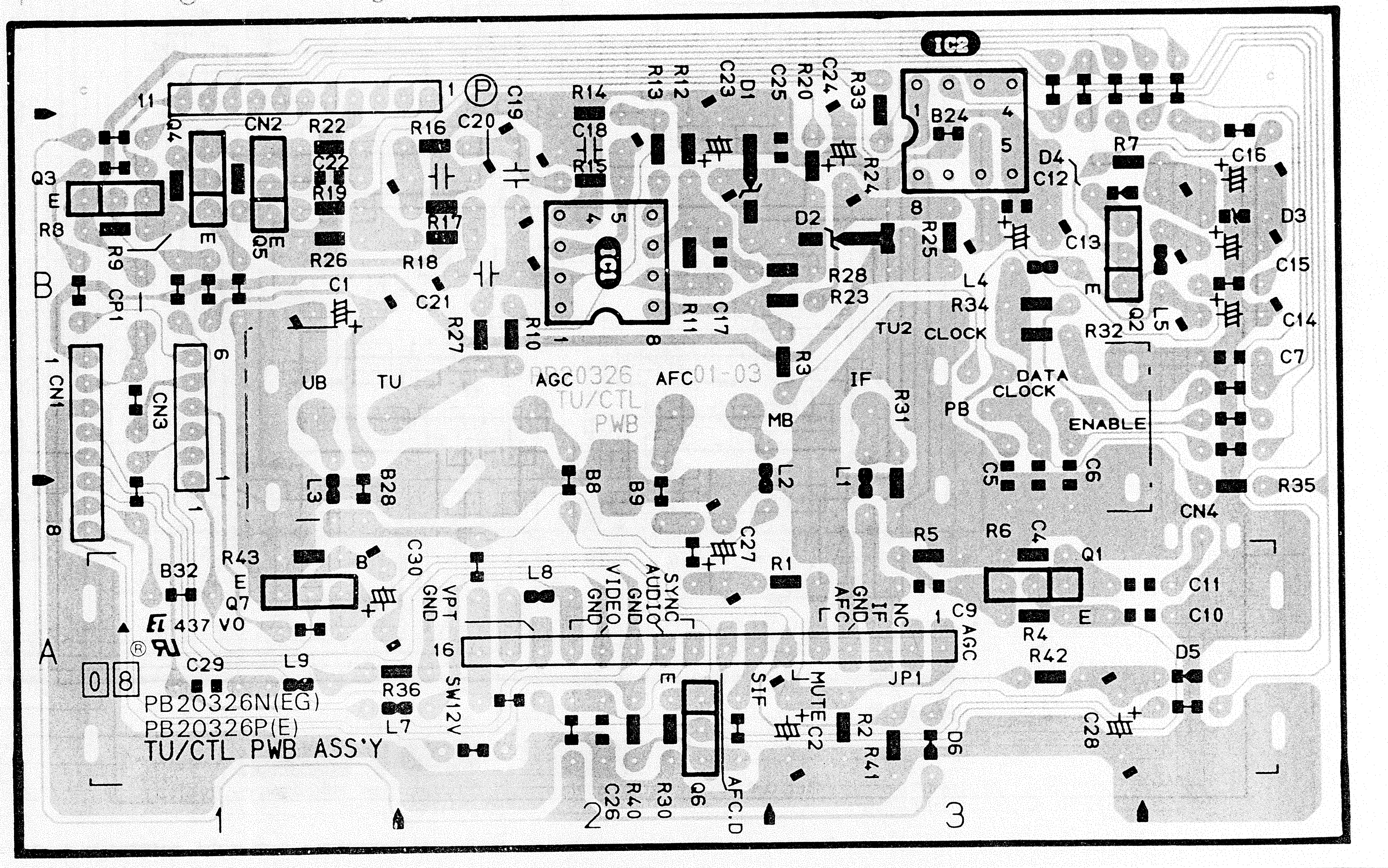
—IF—

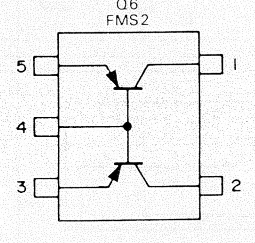

D
C
B
A
5
4
PB10367
IF PWB
PB10367P
IF PWB ASS'Y
R21
RF AGC
T2 VCO
T5
SYNC DET
R40
COLOR LEVEL
IC1
SAW1
SAW2
1
2
3
4
5
6
7

Note: Double edging indicates not used in this model.
Examples; Resistor, Capacitor, Transistor, DIODE

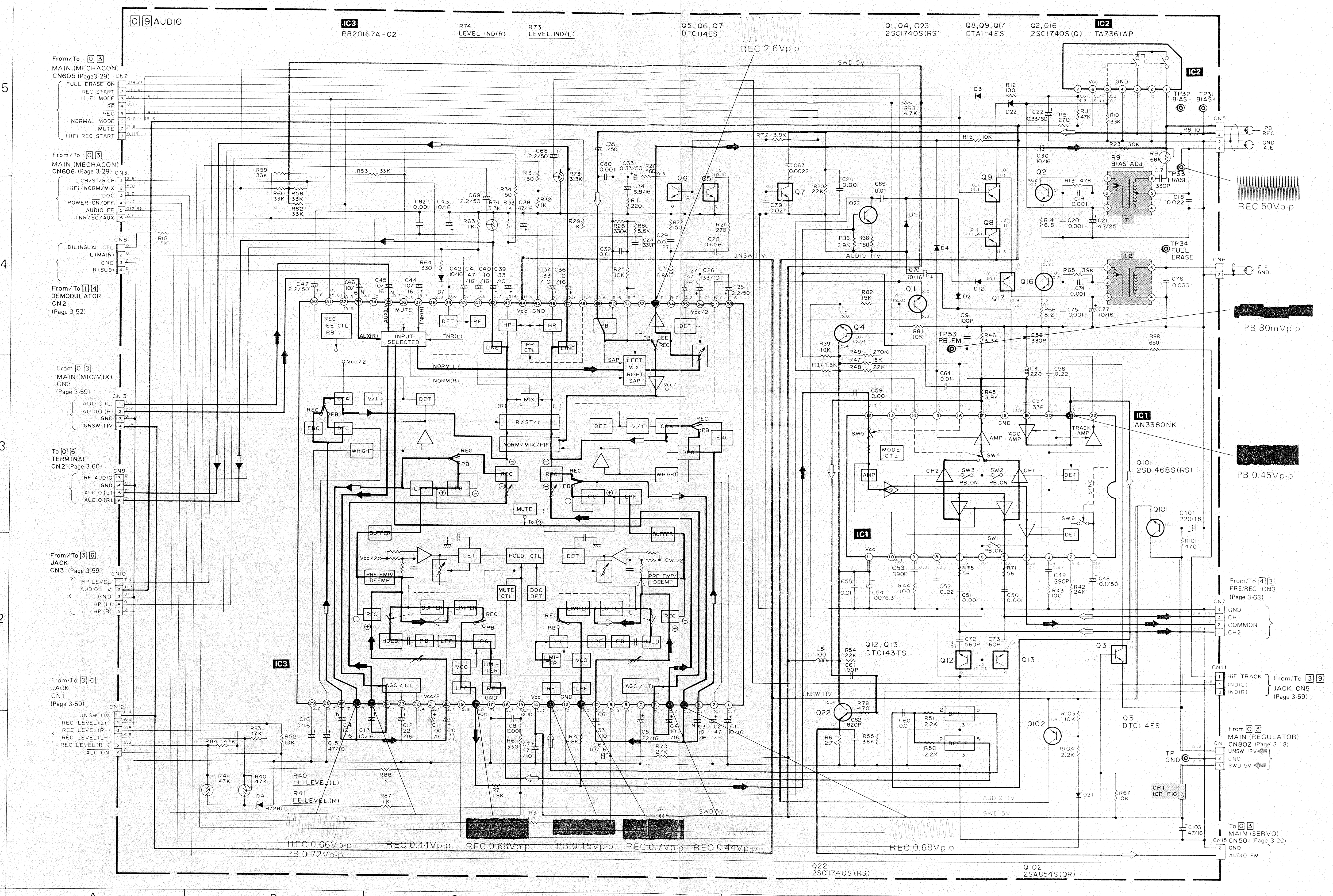


—TNR/CTL—

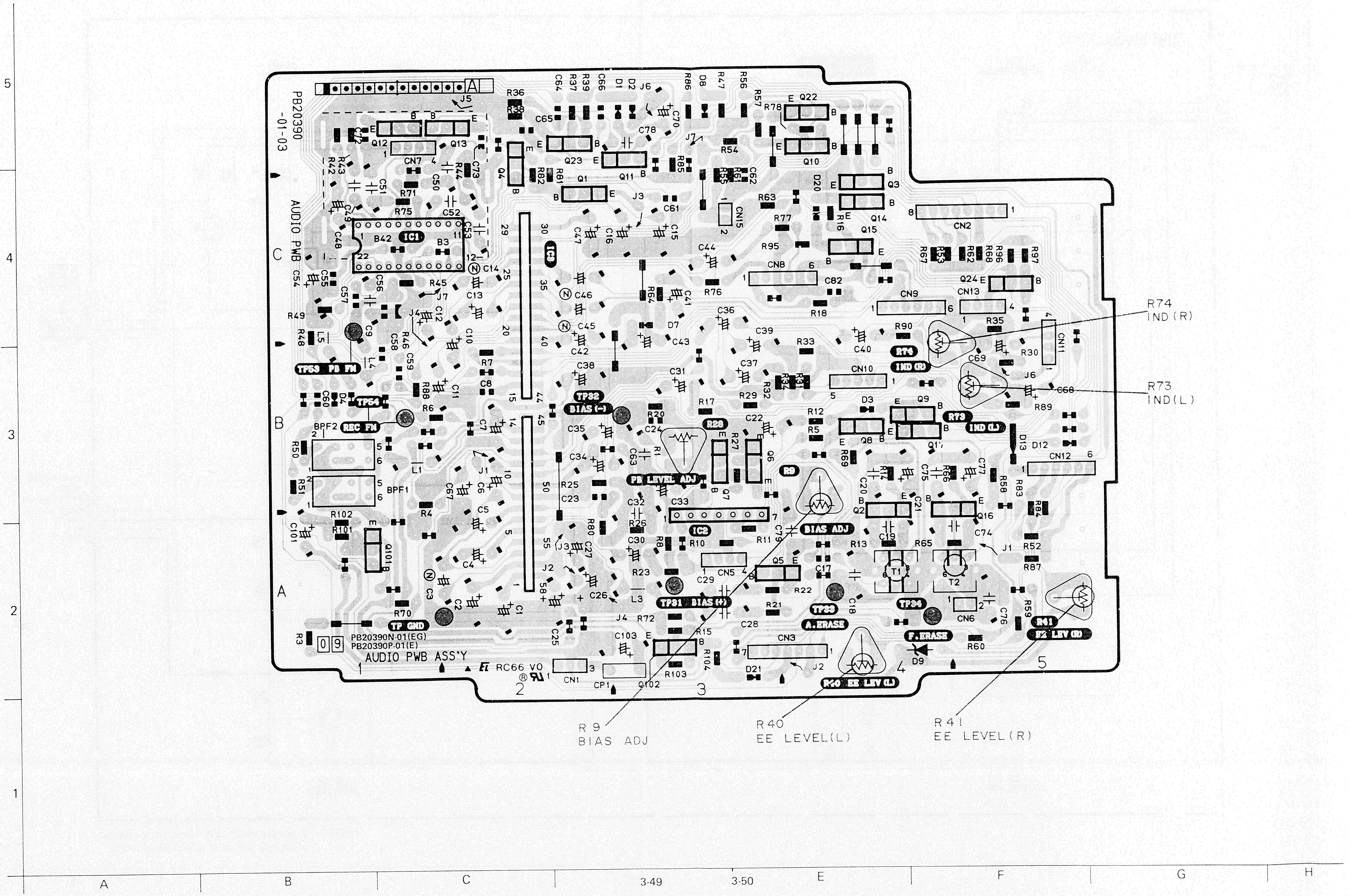

IC1
IC2
CN1
CN2
CN3
CN4
TU2
JP1
PB20326N(EG)
PB20326P(E)
TU/CTL PWB ASS'Y
B
A
1
2
3


Q6
FMS2
5
4
3
1
2

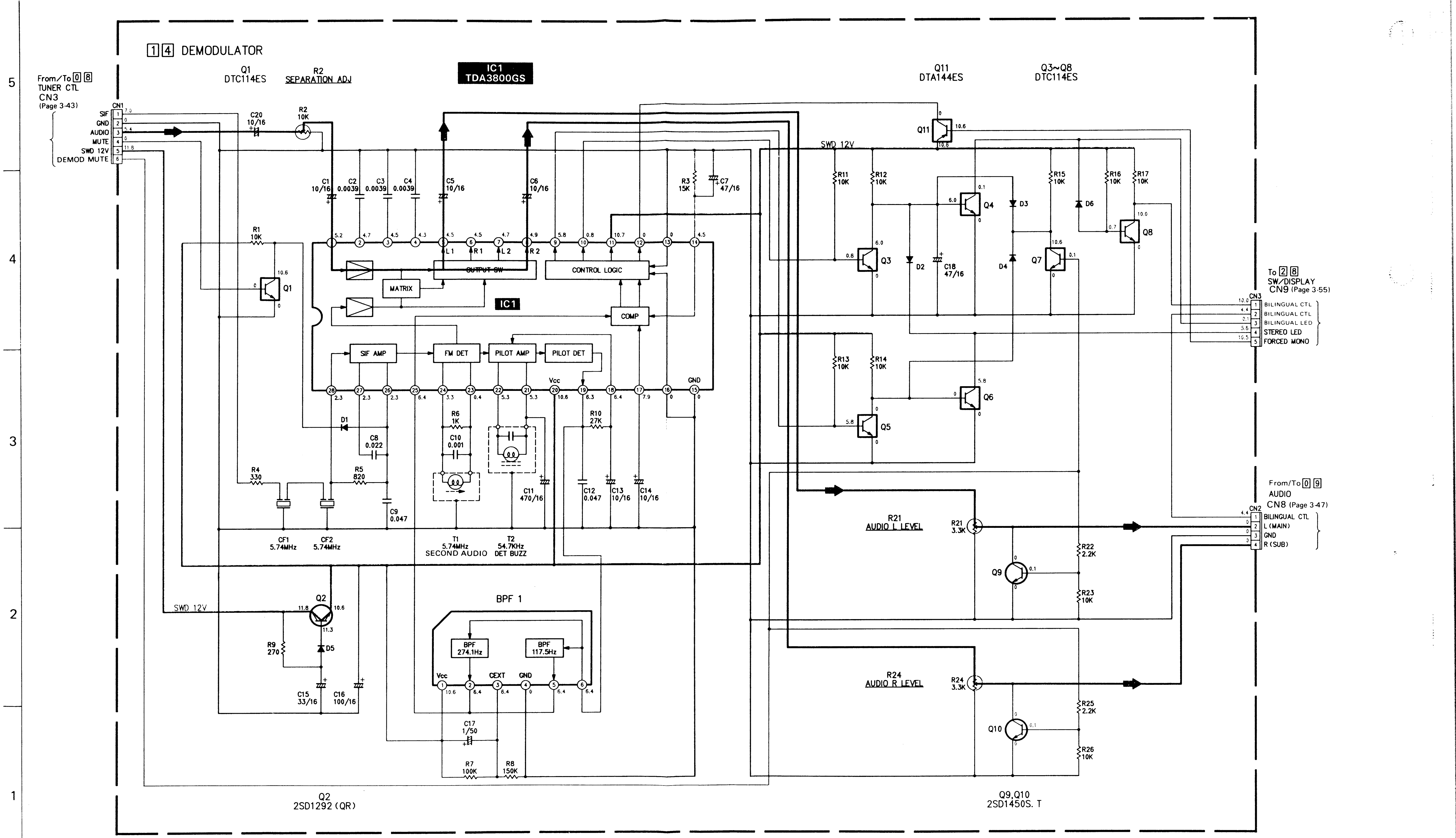
3.24 AUDIO SCHEMATIC DIAGRAM


09 AUDIO
IC3 PB20167A-02
R74 LEVEL IND(R)
R73 LEVEL IND(L)
Q5, Q6, Q7 DTC114ES
REC 2.6Vp-p
Q1, Q4, Q23 2SC1740S(RS)
Q8, Q9, Q17 DTA114ES
Q2, Q16 2SC1740S(Q)
IC2 TA7361AP
From/To 03 MAIN (MECHACON) CN605 (Page3-29)
FULL ERASE ON
REC START
Hi-Fi MODE
SP
REC
NORMAL MODE
MUTE
HiFi REC START
From/To 03 MAIN (MECHACON) CN606 (Page 3-29)
L CH/ST/R CH
HiFi/NORM/MIX
DOC
POWER ON/OFF
AUDIO FF
TNR/SC/AUX
BILINGUAL CTL
L (MAIN)
GND
R (SUB)
From/To 14 DEMODULATOR CN2 (Page 3-52)
From 03 MAIN (MIC/MIX) CN3 (Page 3-59)
AUDIO (L)
AUDIO (R)
GND
UNSW 11V
To 06 TERMINAL CN2 (Page 3-60)
RF AUDIO
GND
AUDIO (L)
AUDIO (R)
From/To 36 JACK CN3 (Page 3-59)
HP LEVEL
AUDIO 11V
GND
HP (L)
HP (R)
From/To 36 JACK CN1 (Page 3-59)
UNSW 11V
REC LEVEL(L+)
REC LEVEL(R+)
REC LEVEL(L-)
REC LEVEL(R-)
ALC ON
R40 EE LEVEL(L)
R41 EE LEVEL(R)
D9 HZ28LL
TP32 BIAS-
TP31 BIAS+
R9 BIAS ADJ
TP33 ERASE
TP34 FULL ERASE
REC 50Vp-p
PB 80mVp-p
TP53 PB FM
IC1 AN3380NK
Q101 2SD1468S(RS)
PB 0.45Vp-p
From/To 43 PRE/REC, CN3 (Page 3-63)
GND
CH1
COMMON
CH2
From/To 39 JACK, CN5 (Page 3-59)
HiFi TRACK
IND(L)
IND(R)
From 03 MAIN (REGULATOR) CN802 (Page 3-18)
UNSW 12V
GND
SWD 5V
To 03 MAIN (SERVO) CN501 (Page 3-22)
GND
AUDIO FM
Q12, Q13 DTC143TS
Q3 DTC114ES
Q22 2SC1740S(RS)
Q102 2SA854S(QR)
CP1 ICP-F10
TP GND
SWD 5V
UNSW 11V
AUDIO 11V
INPUT SELECTED
MUTE
NORM(L)
NORM(R)
LEFT MIX RIGHT SAP
R/ST/L
NORM/MIX/HIFI
HOLD CTL
MUTE CTL
DOC DET
PRE EMP/DEEMP
BUFFER
LIMITER
AGC/CTL
VCO
REC 0.66Vp-p
PB 0.72Vp-p
REC 0.44Vp-p
REC 0.68Vp-p
PB 0.15Vp-p
REC 0.7Vp-p
REC 0.44Vp-p
REC 0.68Vp-p
A
B
C
E
F
G
H
1
2
3
4
5

3.25 AUDIO CIRCUIT BOARD


PB20390
-01-03
AUDIO PWB
R74
IND(R)
R73
IND(L)
R9
BIAS ADJ
R40
EE LEVEL(L)
R41
EE LEVEL(R)
TP53 PB FM
TP54 REC FM
TP GND
TP32 BIAS (−)
TP31 BIAS (+)
PB LEVEL ADJ
BIAS ADJ
A.ERASE
F.ERASE
IND (R)
IND (L)
EE LEV (R)
EE LEV (L)
IC1
IC2
IC3
PB20390N-01(EG)
PB20390P-01(E)
AUDIO PWB ASS'Y
RC66 V0
1
2
3
4
5
A
B
C
D
E
F
G
H

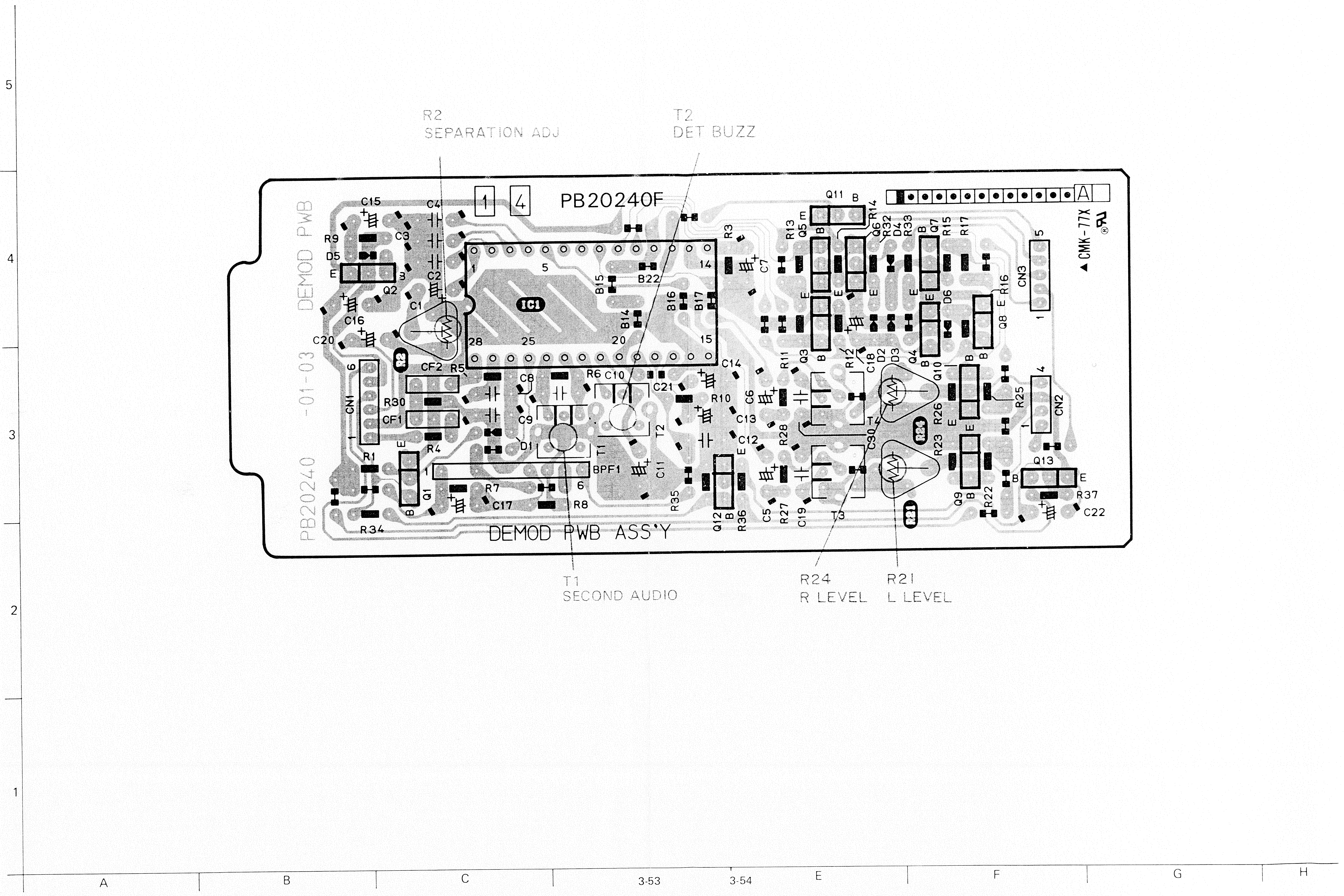
3.26 DEMODULATOR SCHEMATIC DIAGRAM



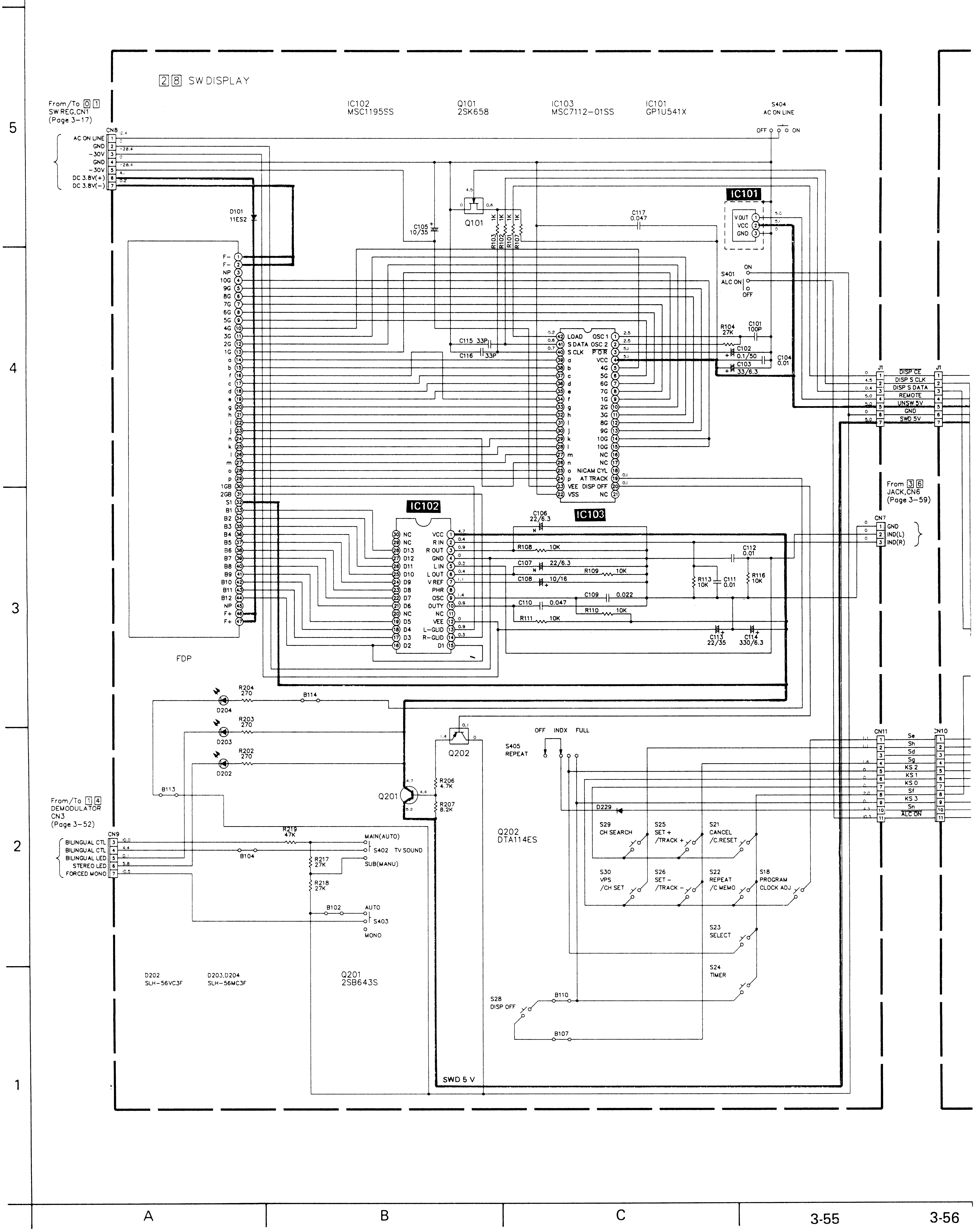
1 4 DEMODULATOR
From/To 0 8
TUNER CTL
CN3
(Page 3-43)
CN1
SIF
GND
AUDIO
MUTE
SWD 12V
DEMOD MUTE
Q1
DTC114ES
R2
SEPARATION ADJ
IC1
TDA3800GS
C20
10/16
R2
10K
C1
10/16
C2
0.0039
C3
0.0039
C4
0.0039
C5
10/16
C6
10/16
R1
10K
Q1
L1
R1
L2
R2
OUTPUT SW
MATRIX
CONTROL LOGIC
COMP
IC1
SIF AMP
FM DET
PILOT AMP
PILOT DET
Vcc
GND
D1
C8
0.022
R4
330
R5
820
C9
0.047
R6
1K
C10
0.001
C11
470/16
R10
27K
C12
0.047
C13
10/16
C14
10/16
CF1
5.74MHz
CF2
5.74MHz
T1
5.74MHz
SECOND AUDIO
T2
54.7KHz
DET BUZZ
SWD 12V
Q2
R9
270
D5
C15
33/16
C16
100/16
BPF 1
BPF
274.1Hz
BPF
117.5Hz
Vcc
CEXT
GND
C17
1/50
R7
100K
R8
150K
Q2
2SD1292 (QR)
Q11
DTA144ES
Q3~Q8
DTC114ES
Q11
SWD 12V
R3
15K
C7
47/16
R11
10K
R12
10K
Q4
D3
R15
10K
D6
R16
10K
R17
10K
Q8
Q3
D2
C18
47/16
D4
Q7
R13
10K
R14
10K
Q6
Q5
To 2 8
SW/DISPLAY
CN9 (Page 3-55)
CN3
BILINGUAL CTL
BILINGUAL CTL
BILINGUAL LED
STEREO LED
FORCED MONO
R21
AUDIO L LEVEL
R21
3.3K
R22
2.2K
Q9
R23
10K
R24
AUDIO R LEVEL
R24
3.3K
R25
2.2K
Q10
R26
10K
From/To 0 9
AUDIO
CN8 (Page 3-47)
CN2
BILINGUAL CTL
L (MAIN)
GND
R (SUB)
Q9,Q10
2SD1450S. T
1
2
3
4
5
A
B
C
E
F
G
H

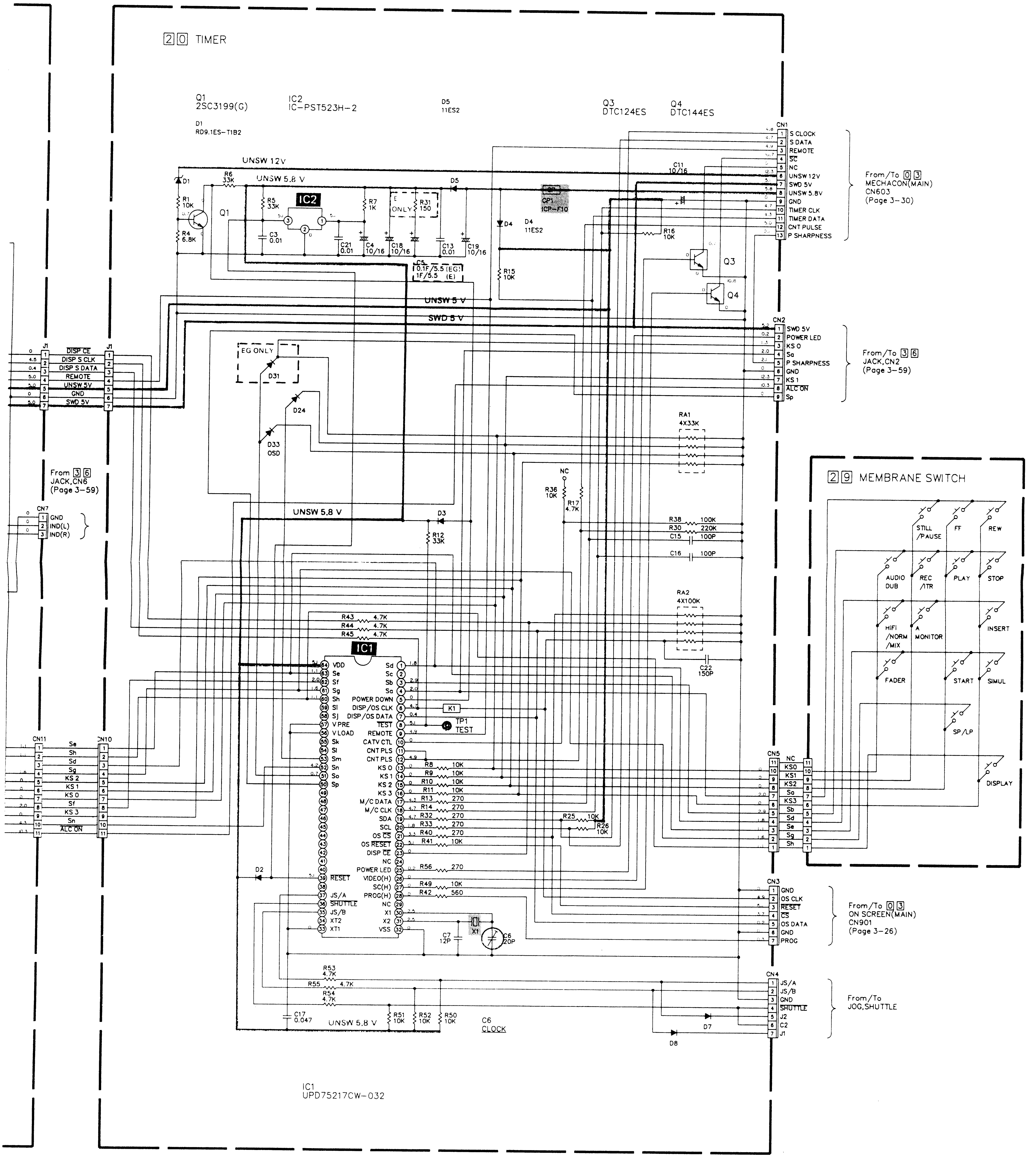
NOTE: Voltages are DC-measured with a digital voltmeter during stop and tuner mode.

3.27 DEMODULATOR CIRCUIT BOARD


R2
SEPARATION ADJ
T2
DET BUZZ
T1
SECOND AUDIO
R24
R LEVEL
R21
L LEVEL
PB20240F
DEMOD PWB
PB20240 -01-03
DEMOD PWB ASS'Y
IC1
CN1
CN2
CN3
CMK-77X
BPF1
CF1
CF2
T3
T4
5
4
3
2
1
A
B
C
E
F
G
H

3.28 TIMER AND SW/DISPLAY SCHEMATIC DIAGRAMS

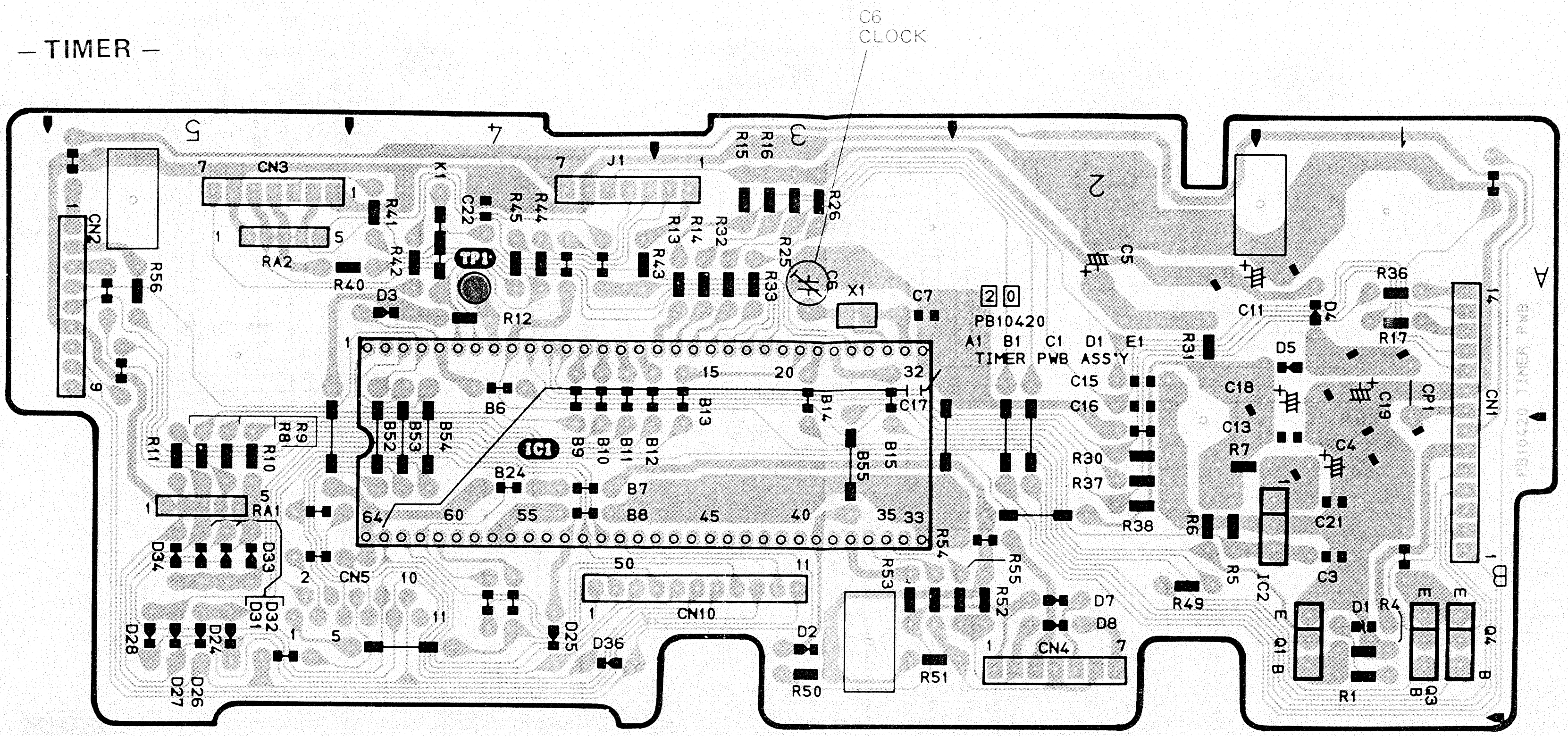

28 SW DISPLAY
From/To 01 SW REG,CN1 (Page 3-17)
CN8
AC ON LINE
GND
-30V
GND
-30V
DC 3.8V(+)
DC 3.8V(-)
D101 11ES2
IC102 MSC1195SS
Q101 2SK658
IC103 MSC7112-01SS
IC101 GP1U541X
S404 AC ON LINE
OFF ON
C105 10/35
Q101
R103 1K
R102 1K
R101 1K
R107 1K
C117 0.047
IC101
VOUT
VCC
GND
S401 ALC ON
ON
OFF
R104 27K
C101 100P
C102 0.1/50
C103 33/6.3
C104 0.01
C115 33P
C116 33P
IC103
LOAD
S DATA
S CLK
OSC 1
OSC 2
POR
VCC
NICAM CYL
AT TRACK
VEE
DISP OFF
VSS
NC
J1
DISP CE
DISP S CLK
DISP S DATA
REMOTE
UNSW 5V
GND
SWD 5V
From 36 JACK,CN6 (Page 3-59)
CN7
GND
IND(L)
IND(R)
FDP
F-
F-
NP
1GB
2GB
S1
B1
B2
B3
B4
B5
B6
B7
B8
B9
B10
B11
B12
F+
F+
IC102
NC
D13
D12
D11
D10
D9
D8
D7
D6
D5
D4
D3
D2
D1
VCC
R IN
R OUT
GND
L IN
L OUT
V REF
PHR
OSC
DUTY
VEE
L-GLID
R-GLID
C106 22/6.3
R108 10K
C107 22/6.3
R109 10K
C108 10/16
C109 0.022
C110 0.047
R110 10K
R111 10K
C112 0.01
R113 10K
C111 0.01
R116 10K
C113 22/35
C114 330/6.3
R204 270
D204
B114
R203 270
D203
R202 270
D202
Q202
Q201
R206 4.7K
R207 8.2K
B113
S405 REPEAT
OFF INDX FULL
D229
CN11
CN10
Se
Sh
Sd
Sg
KS 2
KS 1
KS 0
Sf
KS 3
Sn
ALC ON
From/To 14 DEMODULATOR CN3 (Page 3-52)
CN9
BILINGUAL CTL
BILINGUAL CTL
BILINGUAL LED
STEREO LED
FORCED MONO
R219 47K
B104
R217 27K
R218 27K
MAIN(AUTO)
S402 TV SOUND
SUB(MANU)
B102
AUTO
S403
MONO
Q202 DTA114ES
S29 CH SEARCH
S25 SET + /TRACK +
S21 CANCEL /C.RESET
S30 VPS /CH SET
S26 SET - /TRACK -
S22 REPEAT /C MEMO
S18 PROGRAM CLOCK ADJ
S23 SELECT
S24 TIMER
S28 DISP OFF
B110
B107
D202 SLH-56VC3F
D203,D204 SLH-56MC3F
Q201 2SB643S
SWD 5 V
A
B
C
1
2
3
4
5
6


20 TIMER
Q1 2SC3199(G)
IC2 IC-PST523H-2
D5 11ES2
Q3 DTC124ES
Q4 DTC144ES
D1 RD9.1ES-T1B2
UNSW 12V
UNSW 5.8 V
UNSW 5 V
SWD 5 V
IC1 UPD75217CW-032
CN1
S CLOCK
S DATA
REMOTE
SC
NC
UNSW 12V
SWD 5V
UNSW 5.8V
GND
TIMER CLK
TIMER DATA
CNT PULSE
P SHARPNESS
From/To 03 MECHACON(MAIN) CN603 (Page 3-30)
CN2
SWD 5V
POWER LED
KS 0
Sa
P SHARPNESS
GND
KS 1
ALC ON
Sp
From/To 36 JACK,CN2 (Page 3-59)
J1
DISP CE
DISP S CLK
DISP S DATA
REMOTE
UNSW 5V
GND
SWD 5V
From 36 JACK,CN6 (Page 3-59)
CN7
GND
IND(L)
IND(R)
CN11
CN10
Se
Sh
Sd
Sg
KS 2
KS 1
KS 0
Sf
KS 3
Sn
ALC ON
29 MEMBRANE SWITCH
STILL /PAUSE
FF
REW
AUDIO DUB
REC /TR
PLAY
STOP
HIFI /NORM /MIX
A MONITOR
INSERT
FADER
START
SIMUL
SP/LP
DISPLAY
CN5
NC
KS0
KS1
KS2
Sa
KS3
Sb
Sd
Se
Sg
Sh
CN3
GND
OS CLK
RESET
CS
OS DATA
GND
PROG
From/To 03 ON SCREEN(MAIN) CN901 (Page 3-26)
CN4
JS/A
JS/B
GND
SHUTTLE
J2
C2
J1
From/To JOG,SHUTTLE
VDD
Se
Sf
Sg
Sh
SI
SJ
V PRE
V LOAD
Sk
Sl
Sm
Sn
So
Sp
Sd
Sc
Sb
Sa
POWER DOWN
DISP/OS CLK
DISP/OS DATA
TEST
REMOTE
CATV CTL
CNT PLS
CNT PLS
KS 0
KS 1
KS 2
KS 3
M/C DATA
M/C CLK
SDA
SCL
OS CS
OS RESET
DISP CE
NC
POWER LED
VIDEO(H)
SC(H)
PROG(H)
NC
X1
X2
VSS
RESET
JS/A
SHUTTLE
JS/B
XT2
XT1
R6 33K
R1 10K
R4 6.8K
R5 33K
C3 0.01
C21 0.01
R7 1K
C4 10/16
C18 10/16
R31 150
E ONLY
C13 0.01
C19 10/16
C5 0.1F/5.5 (EG) 1F/5.5 (E)
CP1 ICP-F10
D4 11ES2
R15 10K
C11 10/16
R16 10K
EG ONLY
D31
D24
D33 OSD
RA1 4X33K
NC
R36 10K
R17 4.7K
R38 100K
R30 220K
C15 100P
C16 100P
D3
R12 33K
RA2 4X100K
C22 150P
R43 4.7K
R44 4.7K
R45 4.7K
K1
TP1 TEST
R8 10K
R9 10K
R10 10K
R11 10K
R13 270
R14 270
R32 270
R33 270
R40 270
R41 10K
R25 10K
R26 10K
R56 270
R49 10K
R42 560
D2
C7 12P
X1
C6 20P
R53 4.7K
R55 4.7K
R54 4.7K
C17 0.047
R51 10K
R52 10K
R50 10K
C6 CLOCK
D7
D8

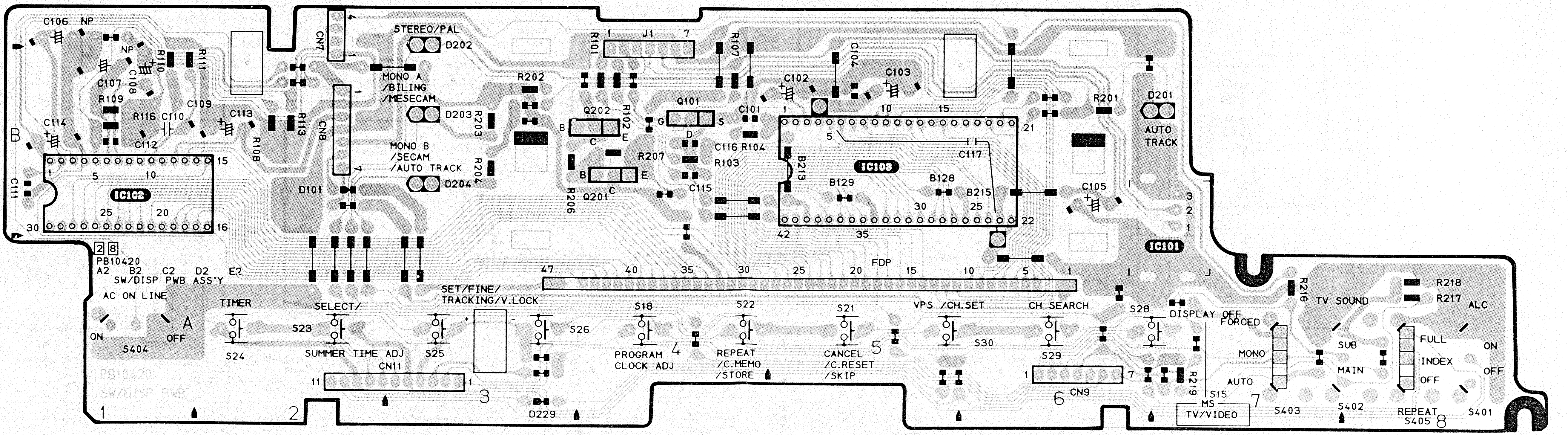
NOTE: Voltages are DC-measured with a digital voltmeter during stop and tuner mode.

3.29 TIMER AND SW/DISPLAY CIRCUIT BOARDS

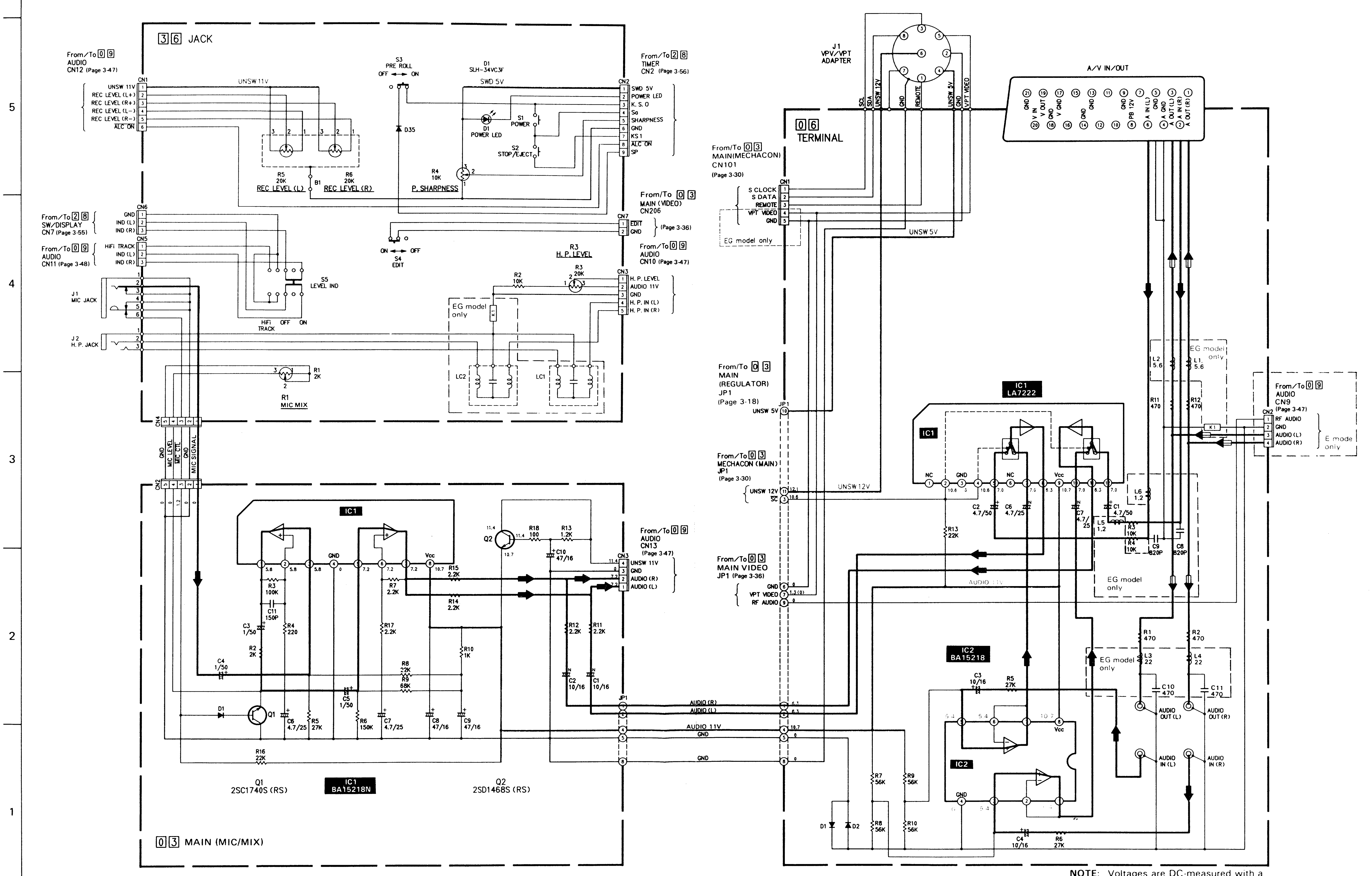
– TIMER –


C6
CLOCK
CN2
CN3
RA2
R40
R41
R42
C22
K1
TP1
R45
R44
R12
D3
J1
R15
R16
R26
R14
R13
R32
R25
R43
R33
C6
X1
C7
PB10420
A1 B1 C1 D1 E1
TIMER PWB ASS'Y
R31
C5
C11
R36
D4
R17
D5
C18
C19
C13
QP1
CN1
R7
C4
C21
C3
R56
IC1
B6
B52
B53
B54
B9
B10
B11
B12
B13
B14
B15
B55
B7
B8
B24
C17
C15
C16
R30
R37
R38
R6
R5
IC2
R11
R10
R9
R8
RA1
D34
D33
D32
D31
D28
D24
D27
D26
D25
D36
CN5
CN10
D2
R50
R53
R54
R55
R52
R51
D7
D8
CN4
R49
D1
R4
Q1
Q3
Q4
R1
TIMER PWB

– SW/DISPLAY –


C106
NP
R110
R111
C107
C108
R109
C109
C114
R116
C110
C113
R113
R108
C112
B
C111
IC102
PB10420
A2 B2 C2 D2 E2
SW/DISP PWB ASS'Y
AC ON LINE
ON
OFF
S404
CN7
CN8
STEREO/PAL
D202
MONO A
/BILING
/MESECAM
D203
R203
MONO B
/SECAM
/AUTO TRACK
D204
R204
D101
R202
R101
J1
R107
Q202
R102
Q201
R206
R207
Q101
C101
C116
R104
R103
C115
C102
C104
C103
IC103
B213
B129
B128
B215
C117
R201
D201
AUTO
TRACK
C105
IC101
FDP
R216
TV SOUND
R218
R217
ALC
TIMER
SELECT/
S23
S24
SUMMER TIME ADJ
S25
SET/FINE/
TRACKING/V.LOCK
S26
CN11
D229
S18
PROGRAM
CLOCK ADJ
S22
REPEAT
/C.MEMO
/STORE
S21
CANCEL
/C.RESET
/SKIP
VPS /CH.SET
S30
CH SEARCH
S29
CN9
S28
DISPLAY OFF
FORCED
MONO
AUTO
S15
MS
TV/VIDEO
R219
SUB
MAIN
S403
S402
FULL
INDEX
OFF
ON
OFF
REPEAT
S405
S401
PB10420
SW/DISP PWB

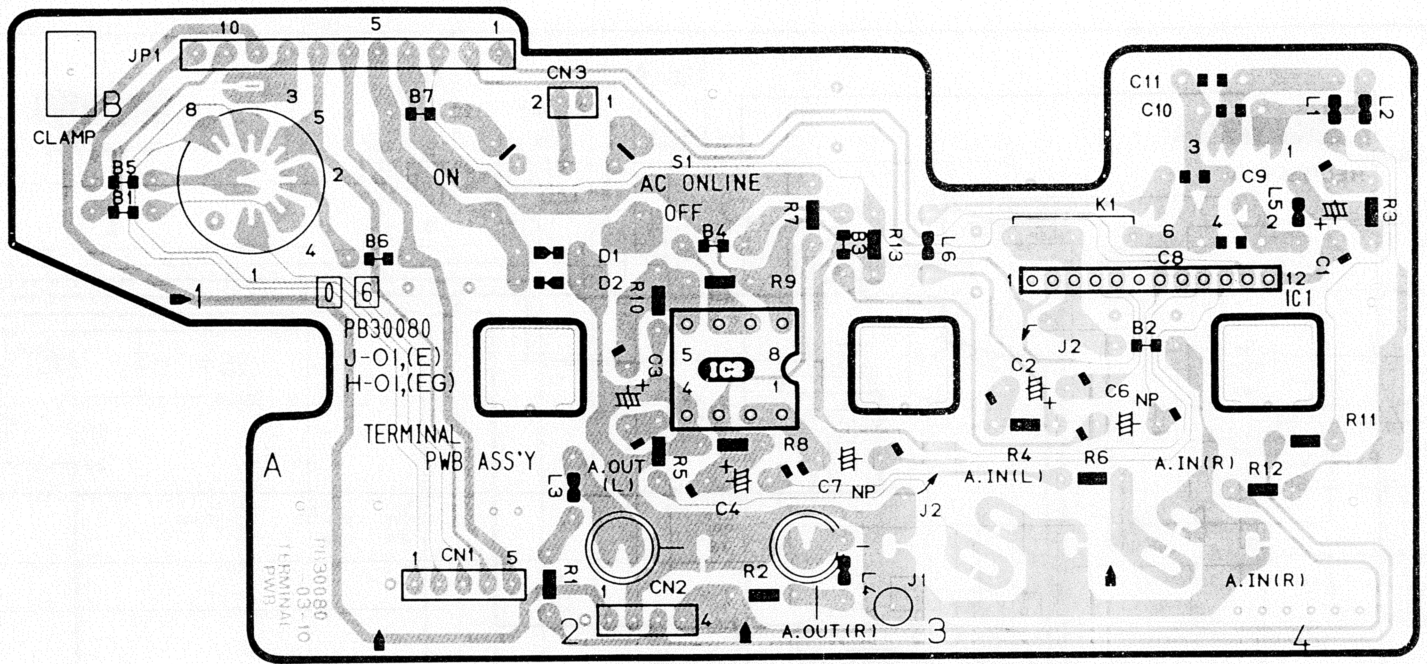
3.30 MIC/MIX, TERMINAL AND JACK SCHEMATIC DIAGRAMS


36 JACK
From/To 09 AUDIO CN12 (Page 3-47)
CN1
UNSW 11V
REC LEVEL (L+)
REC LEVEL (R+)
REC LEVEL (L−)
REC LEVEL (R−)
ALC ON
UNSW 11V
R5 20K REC LEVEL (L)
B1
R6 20K REC LEVEL (R)
S3 PRE ROLL OFF ON
D35
D1 SLH-34VC3F
SWD 5V
D1 POWER LED
S1 POWER
S2 STOP/EJECT
R4 10K P. SHARPNESS
From/To 28 TIMER CN2 (Page 3-56)
CN2
SWD 5V
POWER LED
K. S. O
So
SHARPNESS
GND
KS1
ALC ON
SP
From/To 03 MAIN (VIDEO) CN206
CN7
EDIT
GND
(Page 3-36)
From/To 28 SW/DISPLAY CN7 (Page 3-55)
CN6
GND
IND (L)
IND (R)
From/To 09 AUDIO CN11 (Page 3-48)
CN5
HiFi TRACK
IND (L)
IND (R)
S4 EDIT ON OFF
S5 LEVEL IND
HiFi TRACK OFF ON
J1 MIC JACK
J2 H. P. JACK
R3 H. P. LEVEL
R2 10K
R3 20K
EG model only
LC2
LC1
From/To 09 AUDIO CN10 (Page 3-47)
CN3
H. P. LEVEL
AUDIO 11V
GND
H. P. IN (L)
H. P. IN (R)
R1 2K
R1 MIC MIX
CN4
GND
MIC LEVEL
MIC CTL
GND
MIC SIGNAL
CN2
IC1
R3 100K
C11 150P
C3 1/50
R4 220
R2 2K
C4 1/50
D1
Q1
C6 4.7/25
R5 27K
C5 1/50
R6 150K
C7 4.7/25
R7 2.2K
R17 2.2K
R8 22K
R9 68K
R10 1K
C8 47/16
C9 47/16
R14 2.2K
R15 2.2K
Q2
R18 100
R13 1.2K
C10 47/16
R12 2.2K
R11 2.2K
C2 10/16
C1 10/16
R16 22K
GND
Vcc
From/To 09 AUDIO CN13 (Page 3-47)
CN3
UNSW 11V
GND
AUDIO (R)
AUDIO (L)
JP1
AUDIO (R)
AUDIO (L)
AUDIO 11V
GND
GND
Q1 2SC1740S (RS)
IC1 BA15218N
Q2 2SD1468S (RS)
03 MAIN (MIC/MIX)
J1 VPV/VPT ADAPTER
SCL
SDA
UNSW 12V
GND
REMOTE
UNSW 5V
GND
VPT VIDEO
A/V IN/OUT
GND
V IN
V OUT
GND
V GND
GND
GND
PB 12V
A IN (L)
A GND
A OUT (L)
A IN (R)
A OUT (R)
06 TERMINAL
From/To 03 MAIN(MECHACON) CN101 (Page 3-30)
CN1
S CLOCK
S DATA
REMOTE
VPT VIDEO
GND
EG model only
UNSW 5V
From/To 03 MAIN (REGULATOR) JP1 (Page 3-18)
JP1
UNSW 5V
From/To 03 MECHACON (MAIN) JP1 (Page 3-30)
UNSW 12V
SC
UNSW 12V
From/To 03 MAIN VIDEO JP1 (Page 3-36)
GND
VPT VIDEO
RF AUDIO
IC1 LA7222
IC1
NC
GND
NC
Vcc
C2 4.7/50
C6 4.7/25
C7 4.7/25
C1 4.7/50
R13 22K
L6 1.2
L5 1.2
R3 10K
R4 10K
C9 820P
C8 820P
EG model only
L2 5.6
L1 5.6
R11 470
R12 470
From/To 09 AUDIO CN9 (Page 3-47)
CN2
RF AUDIO
GND
AUDIO (L)
AUDIO (R)
E mode only
K1
AUDIO 11V
R1 470
R2 470
L3 22
L4 22
C10 470
C11 470
IC2 BA15218
C3 10/16
R5 27K
Vcc
IC2
GND
AUDIO OUT (L)
AUDIO OUT (R)
AUDIO IN (L)
AUDIO IN (R)
R7 56K
R9 56K
R8 56K
R10 56K
D1
D2
C4 10/16
R6 27K
A
B
C
D
E
F
G
H
1
2
3
4
5
6

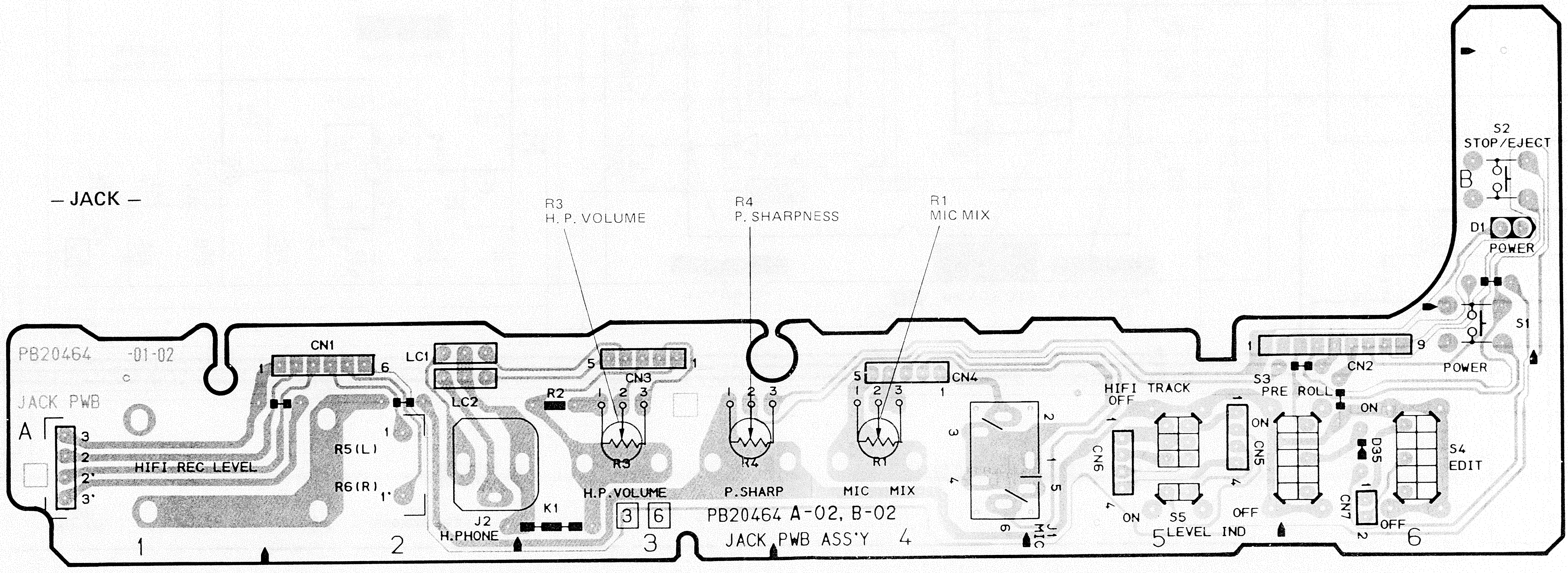
NOTE: Voltages are DC-measured with a digital voltmeter during stop mode.

3.31 TERMINAL AND JACK CIRCUIT BOARDS

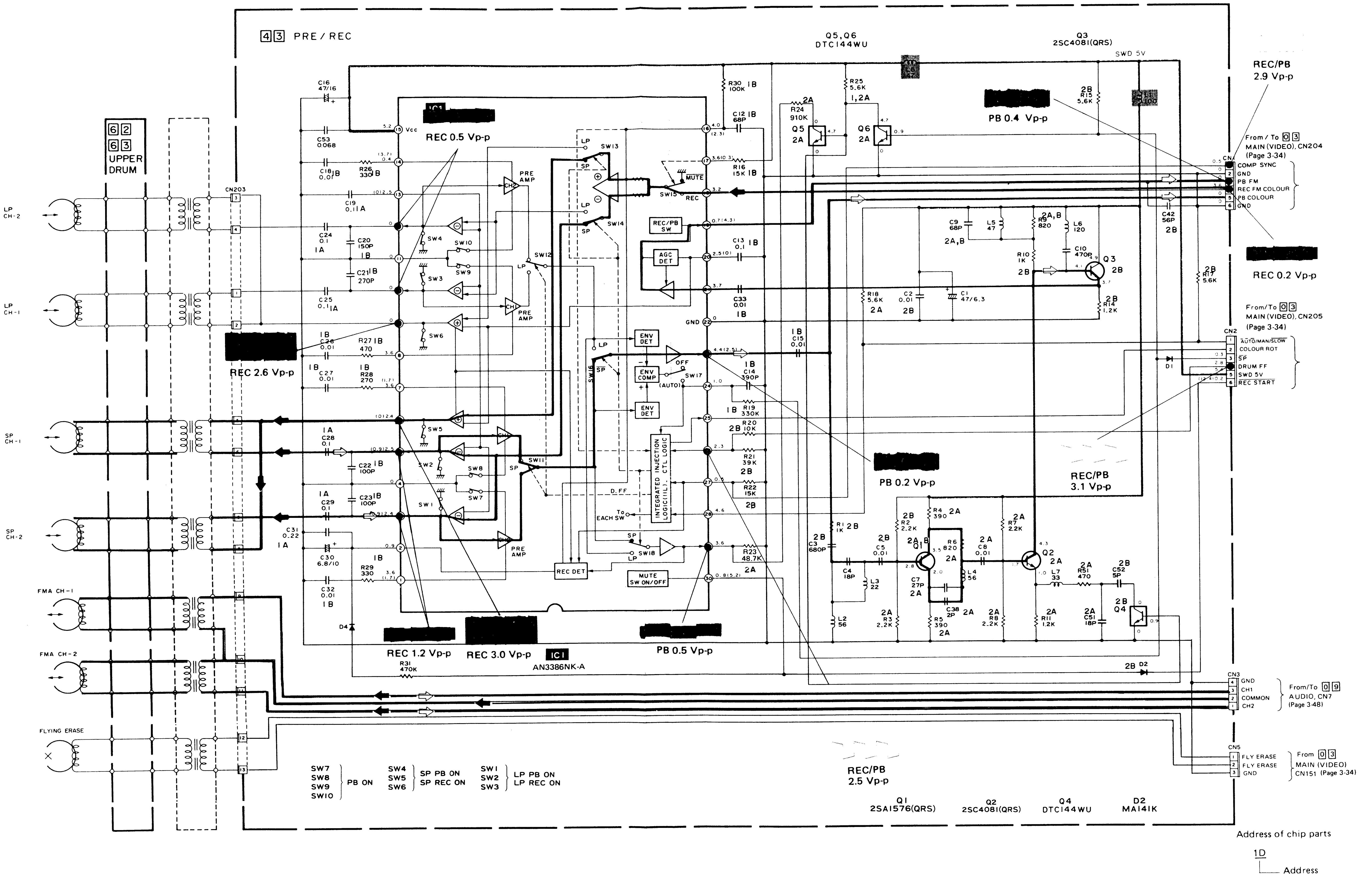
– TERMINAL –


JP1
10
5
1
CLAMP
B
CN3
2
1
B7
B5
B1
B6
ON
S1
AC ONLINE
OFF
B4
D1
D2
R10
R7
B3
R13
L6
R9
K1
C11
C10
C9
L1
L2
L5
R3
C8
C1
IC1
12
PB30080
J-01,(E)
H-01,(EG)
TERMINAL
PWB ASS'Y
A
IC3
C3
J2
B2
C2
C6
NP
R11
R8
R5
C4
C7
L3
A.OUT (L)
R4
A.IN(L)
R6
A.IN(R)
R12
CN1
R1
CN2
R2
L4
J1
A.OUT(R)
A.IN(R)
2
3
4

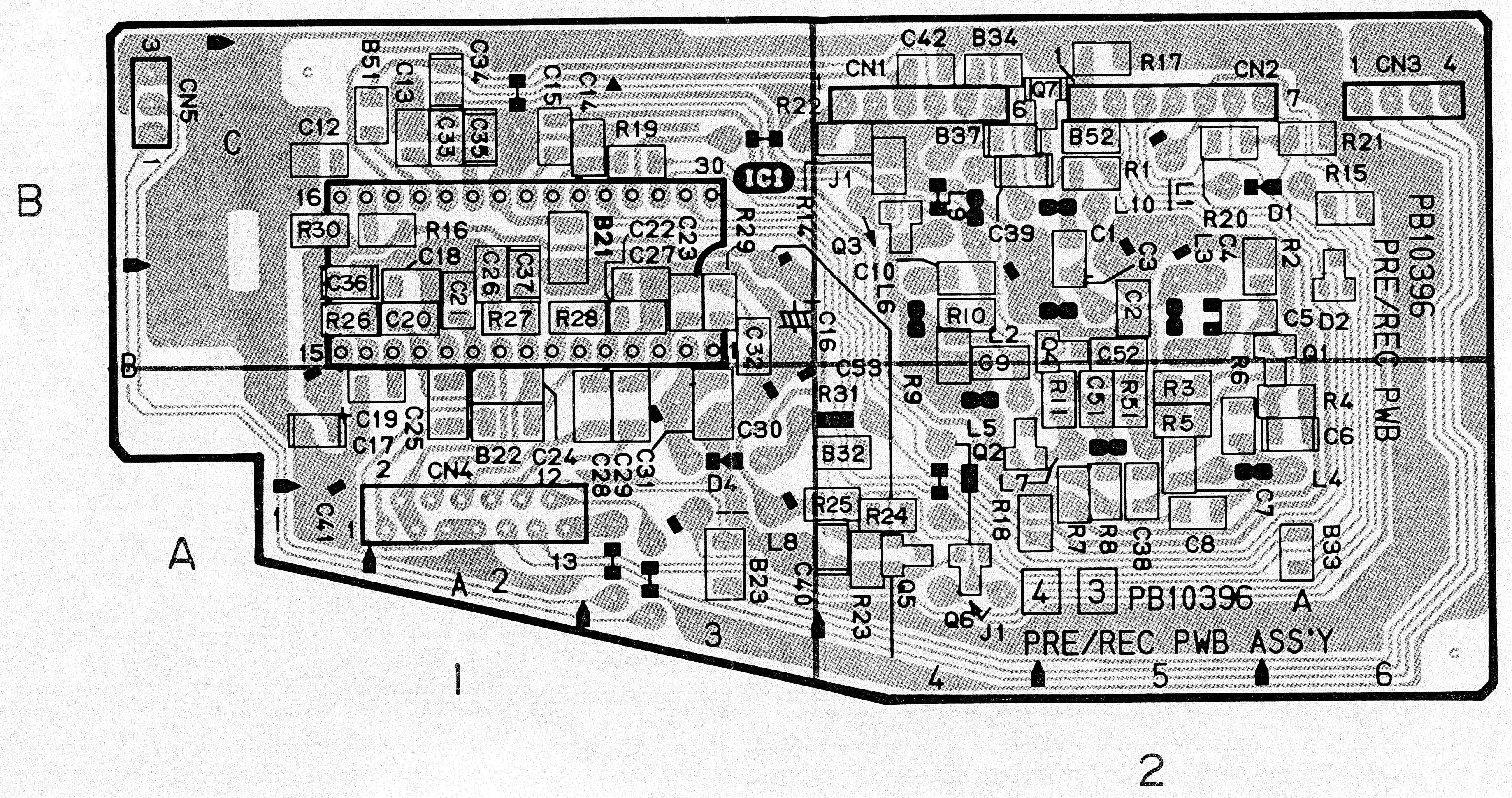
– JACK –


R3
H. P. VOLUME
R4
P. SHARPNESS
R1
MIC MIX
PB20464 -01-02
JACK PWB
A
CN1
LC1
LC2
R2
CN3
CN4
3
2
2'
3'
HIFI REC LEVEL
R5(L)
R6(R)
J2
H.PHONE
K1
H.P.VOLUME
P.SHARP
MIC MIX
PB20464 A-02, B-02
JACK PWB ASS'Y
J1
MIC
HIFI TRACK
OFF
ON
CN6
S5
LEVEL IND
S3
PRE ROLL
CN5
D35
CN7
S4
EDIT
CN2
POWER
S1
S2
STOP/EJECT
B
D1
POWER
1
2
3
4
5
6

3.32 PRE/REC SCHEMATIC DIAGRAM


43 PRE / REC
62
63
UPPER DRUM
LP CH-2
LP CH-1
SP CH-1
SP CH-2
FMA CH-1
FMA CH-2
FLYING ERASE
CN203
REC 0.5 Vp-p
REC 2.6 Vp-p
REC 1.2 Vp-p
REC 3.0 Vp-p
IC1
AN3386NK-A
PB 0.5 Vp-p
PB 0.2 Vp-p
PB 0.4 Vp-p
REC 0.2 Vp-p
REC/PB 2.9 Vp-p
REC/PB 3.1 Vp-p
REC/PB 2.5 Vp-p
PRE AMP
REC/PB SW
AGC DET
ENV DET
ENV COMP
REC DET
MUTE SW ON/OFF
INTEGRATED INJECTION LOGIC(I²L) CTL LOGIC
To EACH SW
D.FF
SW1 – SW18
Q5, Q6 DTC144WU
Q3 2SC4081(QRS)
SWD 5V
CN1
COMP SYNC
GND
PB FM
REC FM COLOUR
PB COLOUR
GND
From / To 03 MAIN (VIDEO), CN204 (Page 3-34)
CN2
AUTO/MAN/SLOW
COLOUR ROT
SP
DRUM FF
SWD 5V
REC START
From / To 03 MAIN (VIDEO), CN205 (Page 3-34)
CN3
GND
CH1
COMMON
CH2
From/To 09 AUDIO, CN7 (Page 3-48)
CN5
FLY ERASE
FLY ERASE
GND
From 03 MAIN (VIDEO) CN151 (Page 3-34)
SW7, SW8, SW9, SW10 PB ON
SW4, SW5, SW6 SP PB ON / SP REC ON
SW1, SW2, SW3 LP PB ON / LP REC ON
Q1 2SA1576(QRS)
Q2 2SC4081(QRS)
Q4 DTC144WU
D2 MA141K
Address of chip parts
1D Address

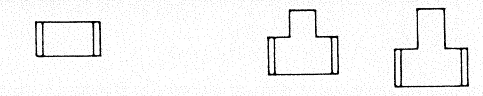
3.33 PRE/REC CIRCUIT BOARD



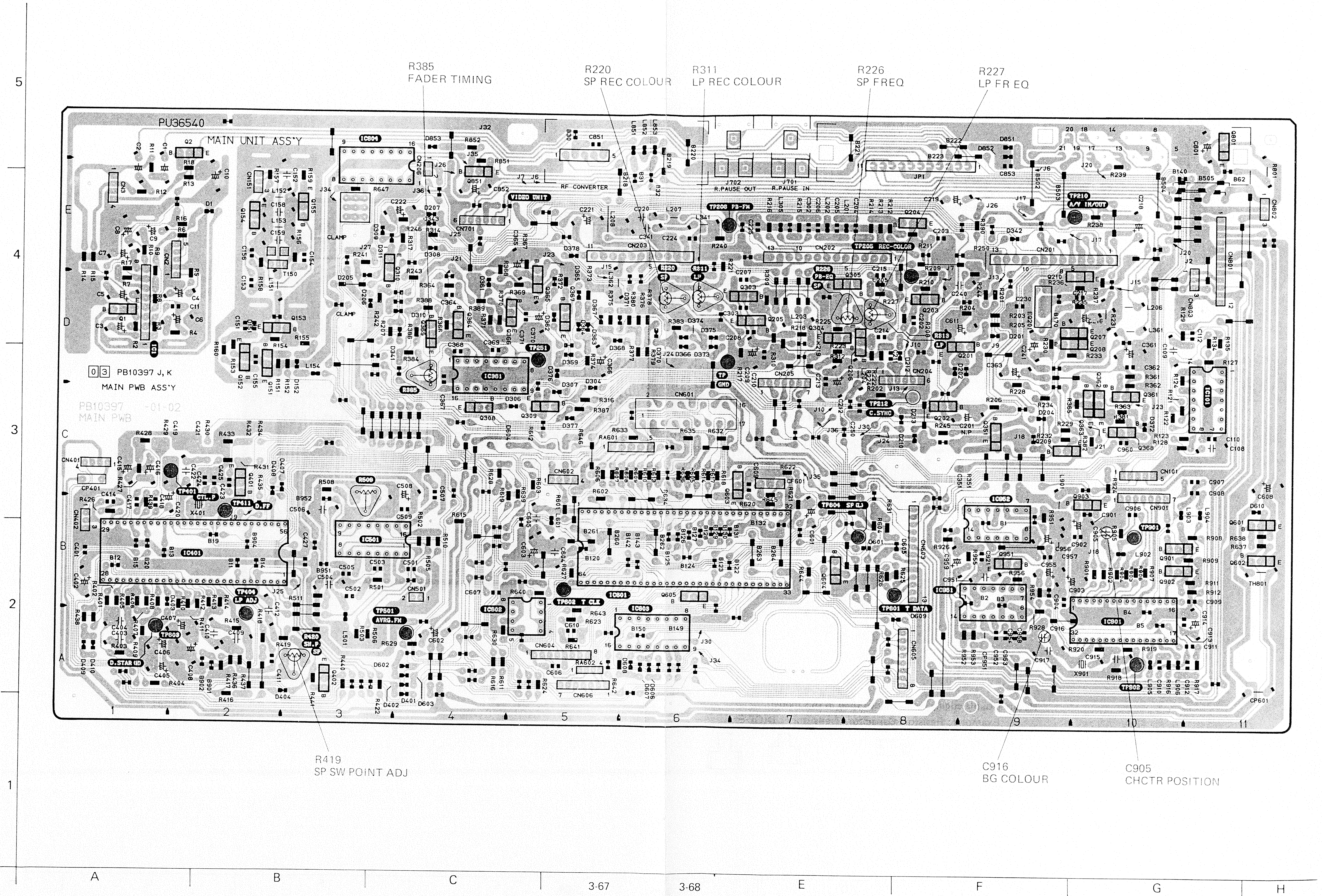
CN5
CN1
CN2
CN3
CN4
IC1
PB10396
PRE/REC PWB
PB10396 A
PRE/REC PWB ASS'Y
C42 B34 R17
B37 Q7 B52 R21 R15
R1 L10 R20 D1 R2
Q3 C39 C1 C3 C4 L3
C10 L6 R10 L2 C2 C5 D2
C9 Q4 C52 R6 Q1
R11 C51 R51 R3 R4 C6
R5 L5 Q2 L7 L4 C7
R18 R7 R8 C38 C8 B33
R22 J1 R14 R29 C16 C53 R31 R9
C32 C30 B32 R25 R24 D4 L8
B23 C40 R23 Q5 Q6 J1
B51 C13 C34 C15 C14 R19
C12 C33 C35
R30 R16 C18 B21 C22 C23 C27
C36 C21 C26 C37
R26 C20 R27 R28
C19 C17 C25 B22 C24 C29 C28 C31
C41
A B C
1 2 3 4 5 6
16 30 15 1 2 12 13 7 4

Note: Double edging indicates not used in this model.

Examples ; Resistor, Capacitor, Transistor, DIODE



3.34 MAIN CIRCUIT BOARD


PU36540
MAIN UNIT ASS'Y
03 PB10397 J,K
MAIN PWB ASS'Y
PB10397 -01-02
MAIN PWB
RF CONVERTER
R.PAUSE OUT
R.PAUSE IN
VIDEO UNIT
CLAMP
IC301
IC401
IC501
IC601
IC602
IC603
IC801
IC804
IC901
IC951
IC952
IC101
TP210 A/V IN/OUT
TP206 PB-FM
TP205 REC-COLOR
TP251
TP GND
TP212 C.SYNC
TP401 CTL.P
TP411 D.FF
TP406 LP ADJ
TP403 D.STAR
TP501 AVRG.FM
TP602 T CLK
TP604 SP CL
TP601 T DATA
TP901
TP902
5
4
3
2
1
A
B
C
D
E
F
G
H

R385
FADER TIMING

R220
SP REC COLOUR

R311
LP REC COLOUR

R226
SP FREQ

R227
LP FR EQ

R419
SP SW POINT ADJ

C916
BG COLOUR

C905
CHCTR POSITION

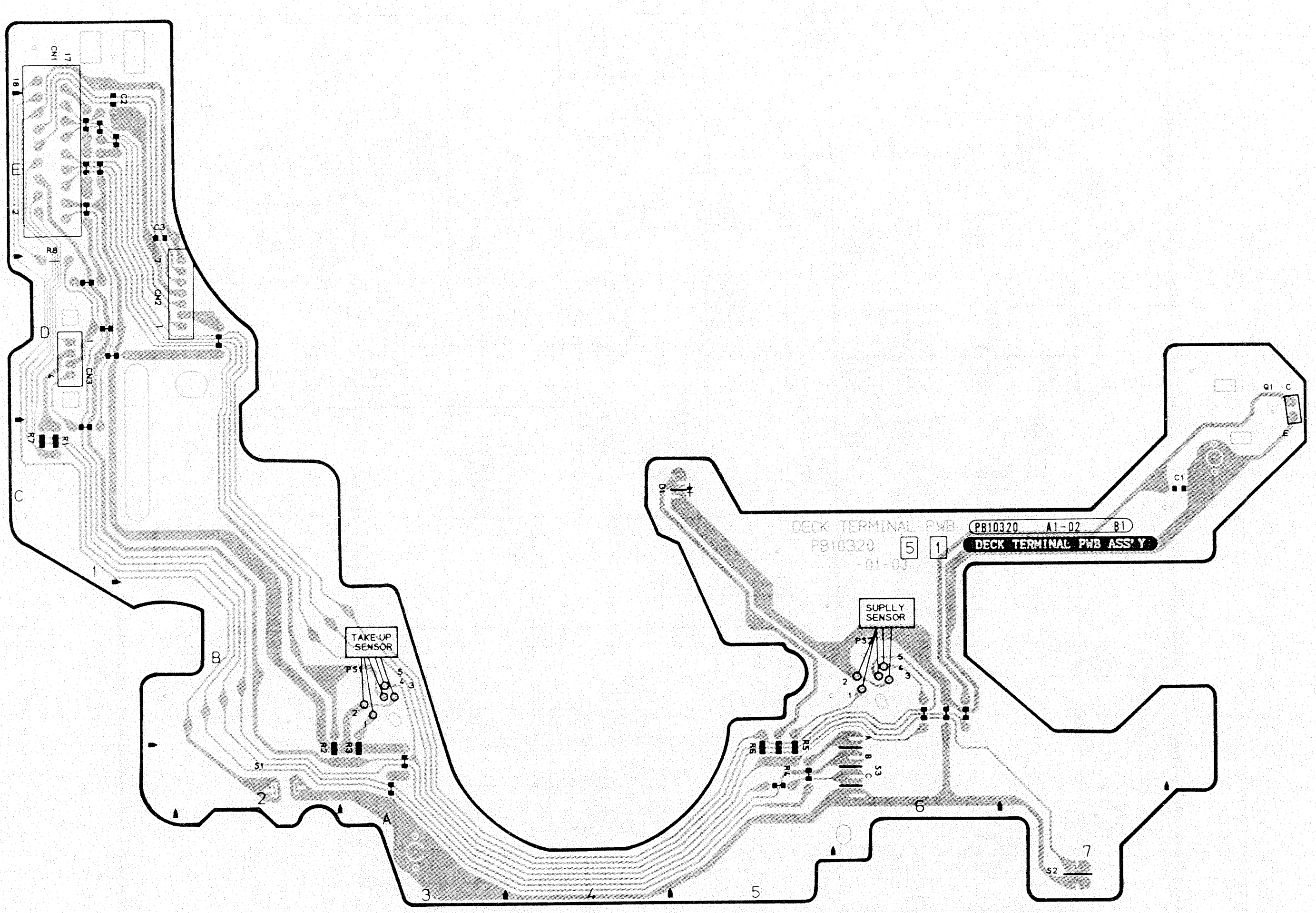
6

3.35 DECK TERMINAL, MODE MOTOR, C. HOUSING, A/CTL HEAD CIRCUIT BOARDS

5

– DECK TERMINAL –

4

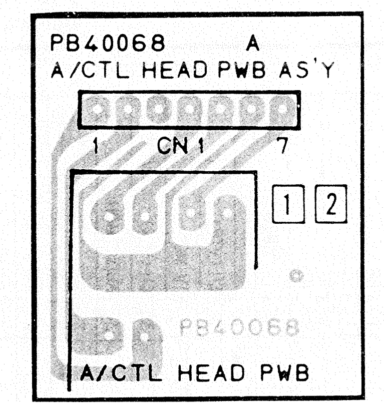

CN1
E
D
C
B
A
1
2
3
4
5
6
7
R8
CN2
CN3
R7
R1
C3
TAKE-UP SENSOR
PS1
R2
R3
S1
S2
D1
DECK TERMINAL PWB
PB10320
-01-03
5
1
PB10320 A1-02 B1
DECK TERMINAL PWB ASS'Y
SUPLLY SENSOR
PS2
R6
R5
R4
S3
C1
Q1

3

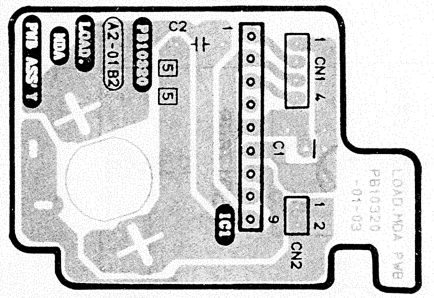
2

1

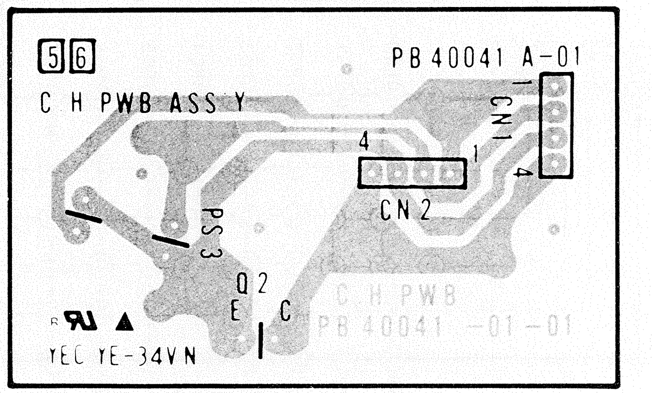
– A/C HEAD –


PB40068 A
A/CTL HEAD PWB AS'Y
1
CN1
7
1
2
PB40068
A/CTL HEAD PWB

– MDA –


C2
CN1
C1
IC1
CN2
5
5
AZ-0182
LOAD MDA PWB
PB10320
-01-03

– CASSETTE HOUSING –


5
6
PB 40041 A-01
C H PWB ASS'Y
CN1
1
4
4
1
CN 2
PS 3
Q 2
E
C
C H PWB
PB 40041 -01-01
YEC YE-34VN

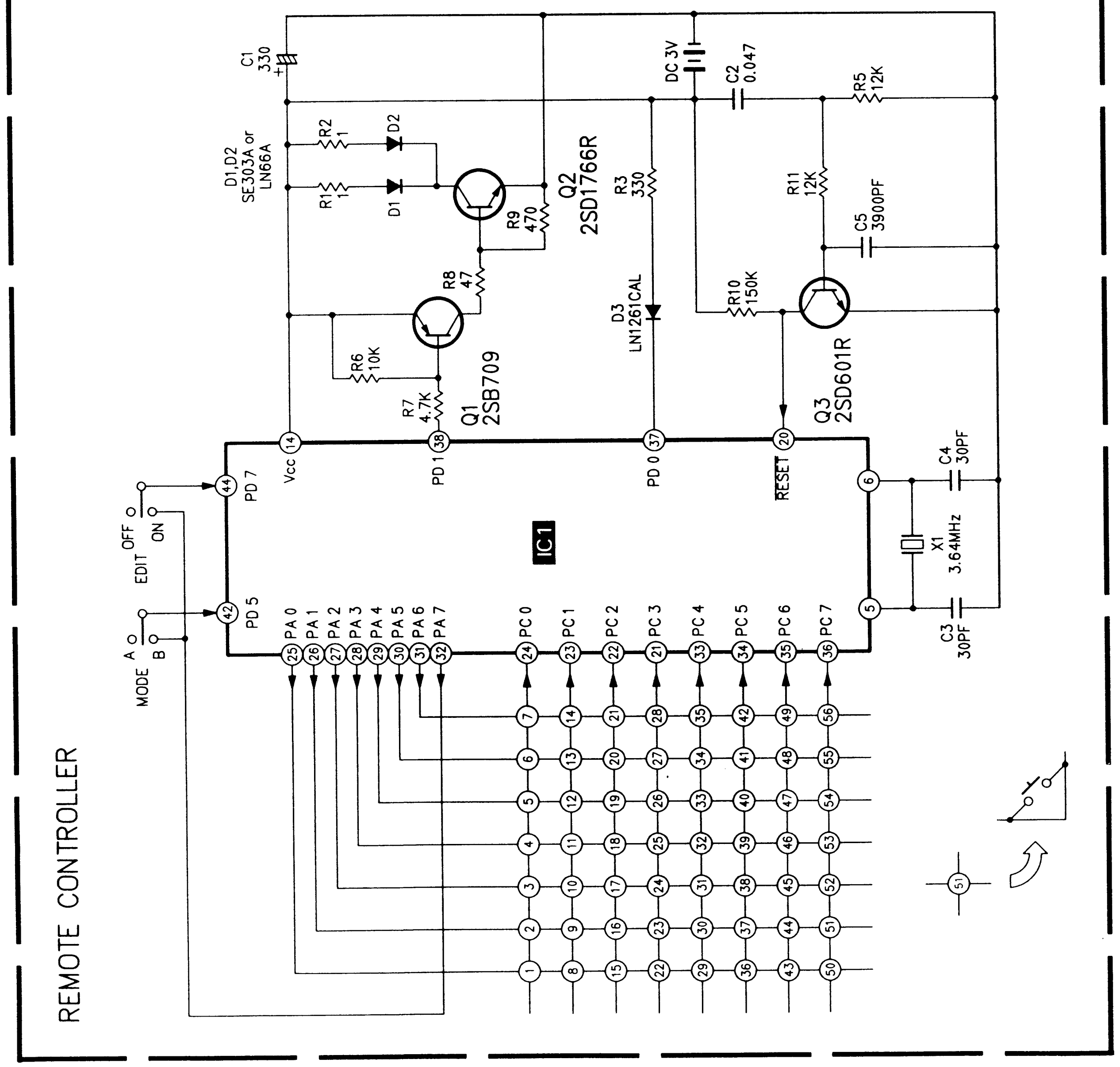
A B C

E F G H

3.36 REMOTE CONTROL SCHEMATIC DIAGRAM

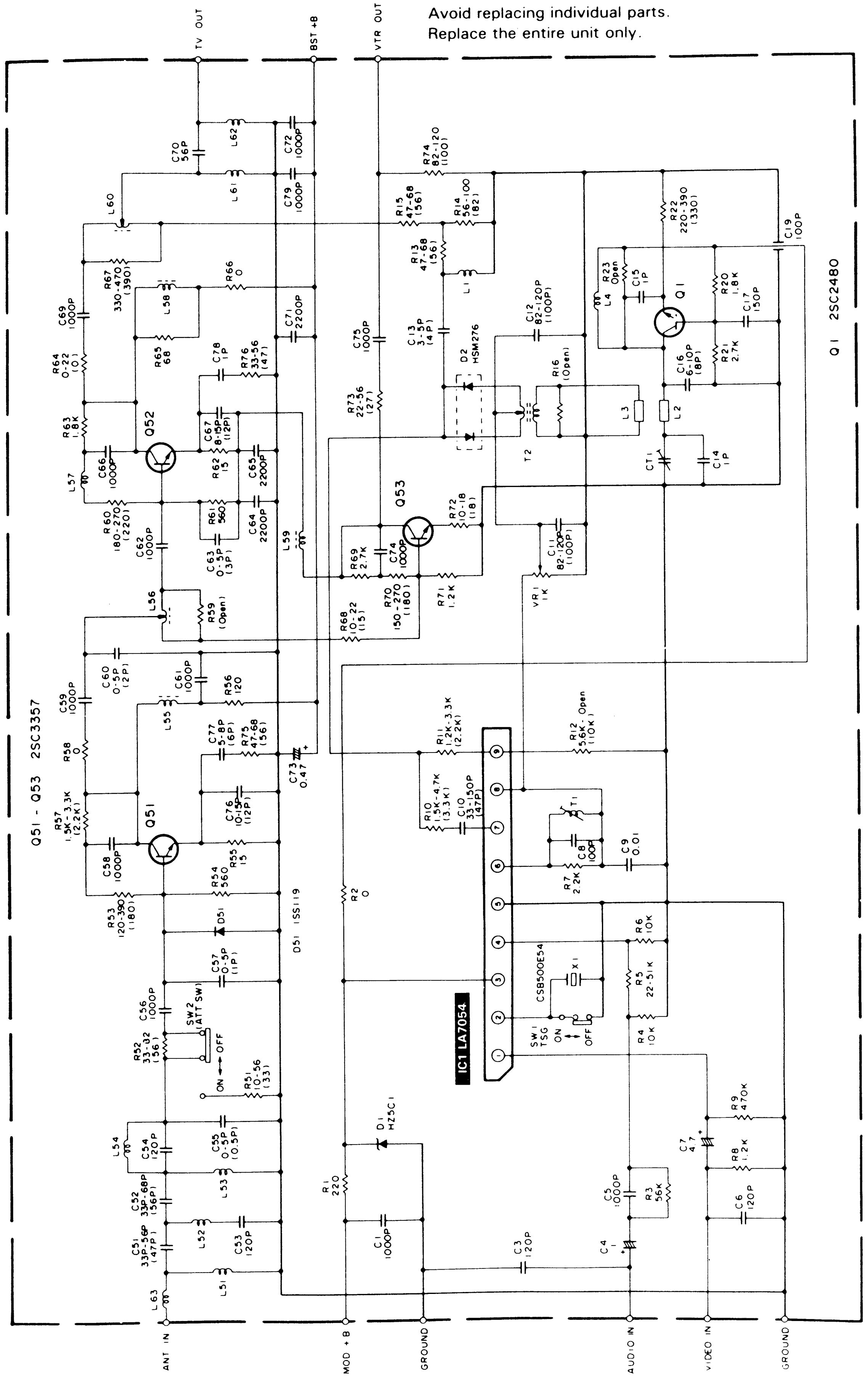
NOTES:
1. All parts shown in this schematic are critical for safety.
2. This schematic is only for reference.
Avoid replacing individual parts.
Replace the entrie unit only.

No.	KEY NAME	No.	KEY NAME
1	MARK	29	MEMORY
2	ERASE	30	MONITOR
3	INDEX	31	CH (TV) ∨
4	GOTO	32	DISPLAY
5	13	33	TIMER
6	ENTER	34	CH (TV) ∧
7	INTRO	35	VOL (TV) ∨
8	10	36	EJECT
9	7	37	14
10	11	38	AUDIO MON
11	12	39	CH (VTR) ∨
12	8	40	TV MON
13	9	41	CH (VTR) ∧
14	AUX/O	42	STANDBY
15	6	43	POWER (VTR)
16	MENU	44	TV/VIDEO
17	1	45	REC
18	2	46	STOP
19	3	47	FF
20	4	48	SKIP
21	5	49	START
22	CANCEL	50	VTR SEARCH ∨
23	POWER	51	REW
24	SET (−)	52	NC
25	RESET	53	PLAY
26	SET (+)	54	PAUSE
27	SELECT	55	VTR SEARCH ∧
28	SP/EP	56	VOL (TV) ∧


REMOTE CONTROLLER
IC1
C1 330
D1,D2 SE303A or LN66A
R1 1
R2 1
D1
D2
Q2 2SD1766R
R9 470
R8 47
Q1 2SB709
R6 10K
R7 4.7K
R3 330
D3 LN1261CAL
DC 3V
C2 0.047
R5 12K
R11 12K
C5 3900PF
R10 150K
Q3 2SD601R
C4 30PF
X1 3.64MHz
C3 30PF
Vcc
PD 7
PD 5
PD 1
PD 0
RESET
PA 0
PA 1
PA 2
PA 3
PA 4
PA 5
PA 6
PA 7
PC 0
PC 1
PC 2
PC 3
PC 4
PC 5
PC 6
PC 7
EDIT
OFF
ON
MODE
A
B

3.37 RF CONVERTER SCHEMATIC DIAGRAM

NOTES:
1. All parts shown in this schematic are critical for safety.
2. This schematic is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.


TV OUT
BST +8
VTR OUT
IC1 LA7054
Q51 - Q53 2SC3357
Q1 2SC2480
D51 1SS119
D1 HZ5C1
D2 HSM276
SW2 ATT SW
ON ↔ OFF
SW1 TSG
CSB500E54
X1
T2
CT1
VR1 1K
ANT IN
MOD +B
GROUND
AUDIO IN
VIDEO IN
GROUND

SECTION 4
EXPLODED VIEWS AND PARTS LIST

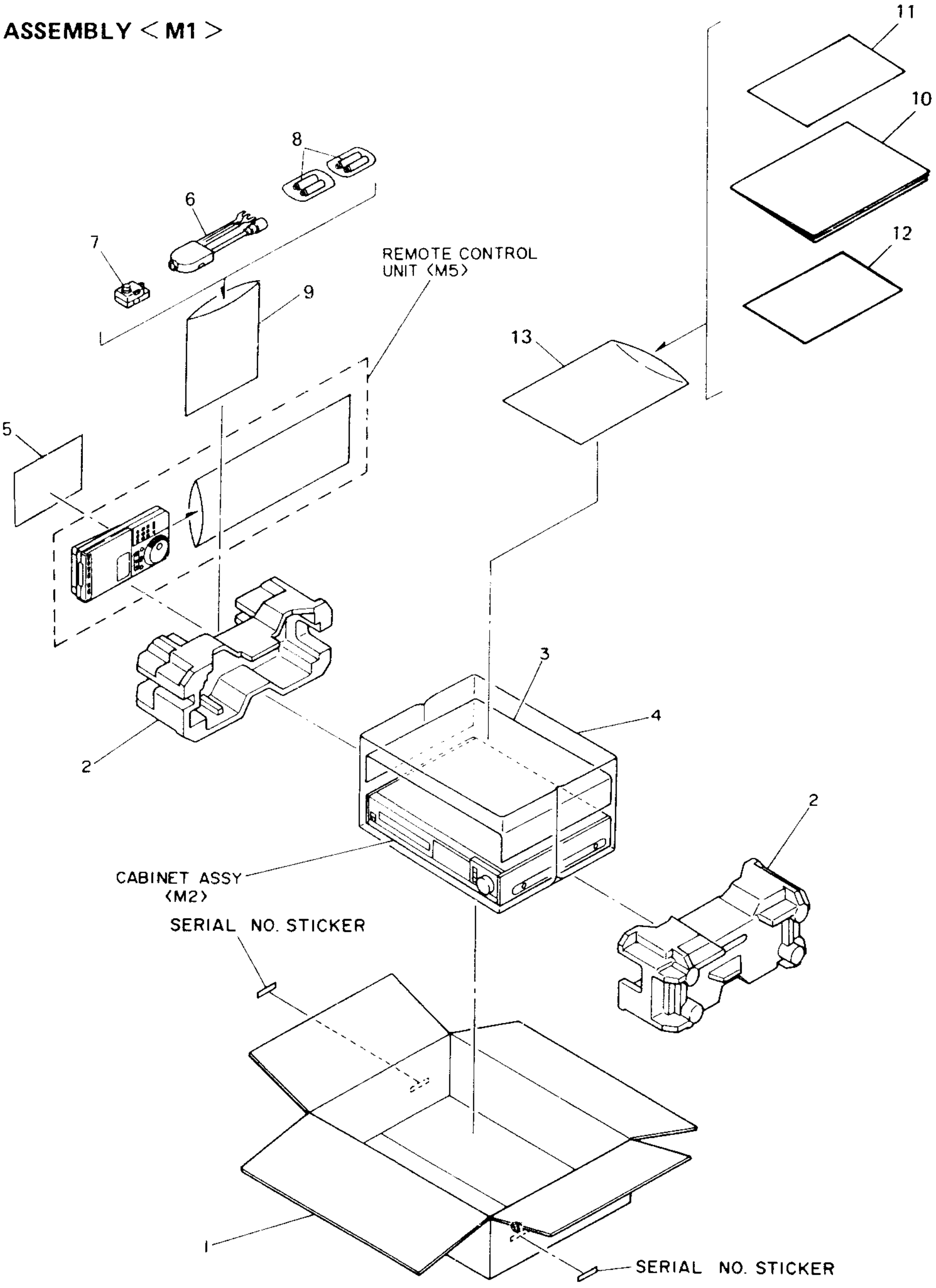
SAFETY PRECAUTION

Parts identified by the △ symbol are critical for safety. Replace only with specified part numbers.

NOTE:

[M] indicates mechanical symbol number.

4.1 PACKING ASSEMBLY < M1 >


11
10
12
8
6
7
REMOTE CONTROL UNIT <M5>
9
13
5
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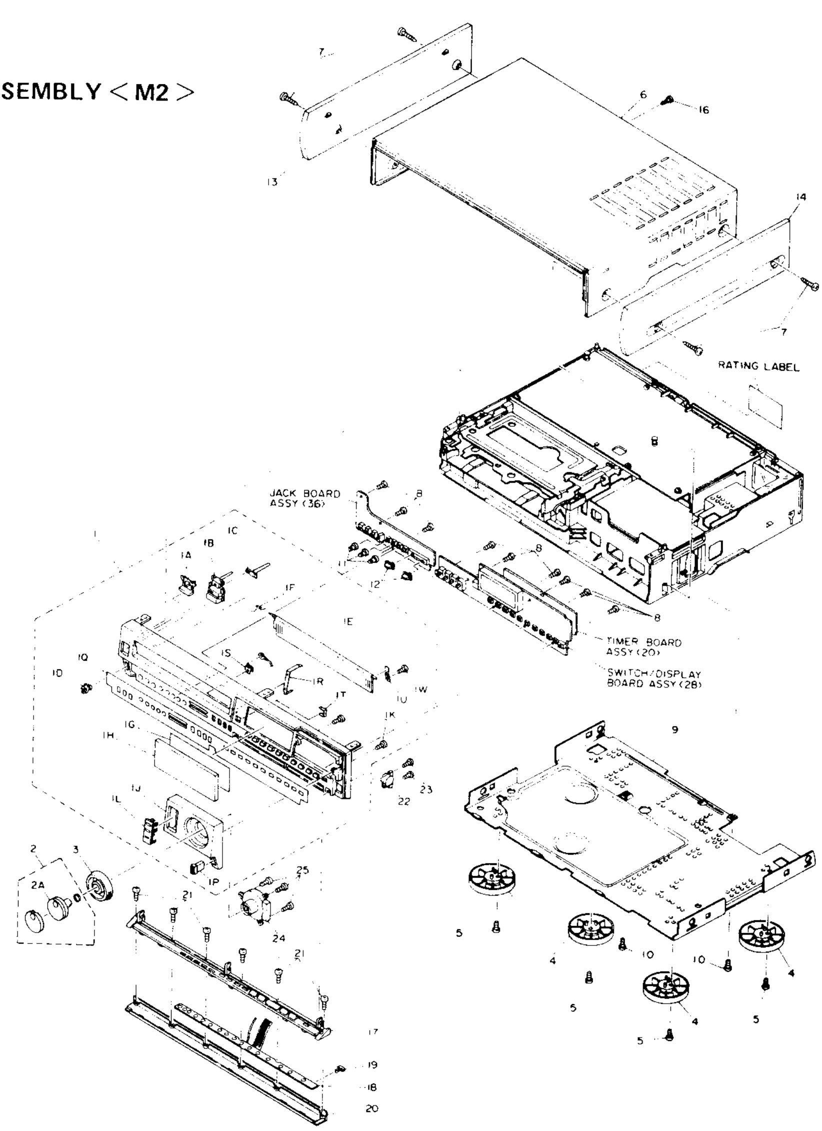
2
CABINET ASSY <M2>
SERIAL NO. STICKER
1
SERIAL NO. STICKER

****

PACKING ASSEMBLY <M1>

#△	REF No.	PART No.	PART NAME, DESCRIPTION
	1	PQ33636-2	PACKING CASE,E
	1	PQ33636	PACKING CASE,EG
	2	PQ33634A	CUSHION ASSY
	3	PQ41026-20	PROTECT SHEET
	4	PQM30021-59-11	POLY BAG
	5	PQ42987-12	SHEET
	6	PU56142-3	PIN CORD ASSY
		or PU56142-5	PIN CORD ASSY
	7	PU59168-3	RF CABLE
		or PU59167-3	RF CABLE
	8	UM-3DJ2P	BATTERY,X4
	9	QPGA020-02005	POLY BAG
△	10	PU30425-1161	INSTRUCTIONS,EG
△	10	PU30425-1165	INSTRUCTIONS,E
	11	BT-20114	WARRANTY CARD,EG
△	12	—	DBP INF SHEET,EG
	13	QPGA025-03505	POLY BAG

4.2 CABINET ASSEMBLY < M2 >


RATING LABEL
JACK BOARD ASSY (36)
TIMER BOARD ASSY (20)
SWITCH/DISPLAY BOARD ASSY (28)
1
1A
1B
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△ REF No.	PART No.	PART NAME, DESCRiPTION

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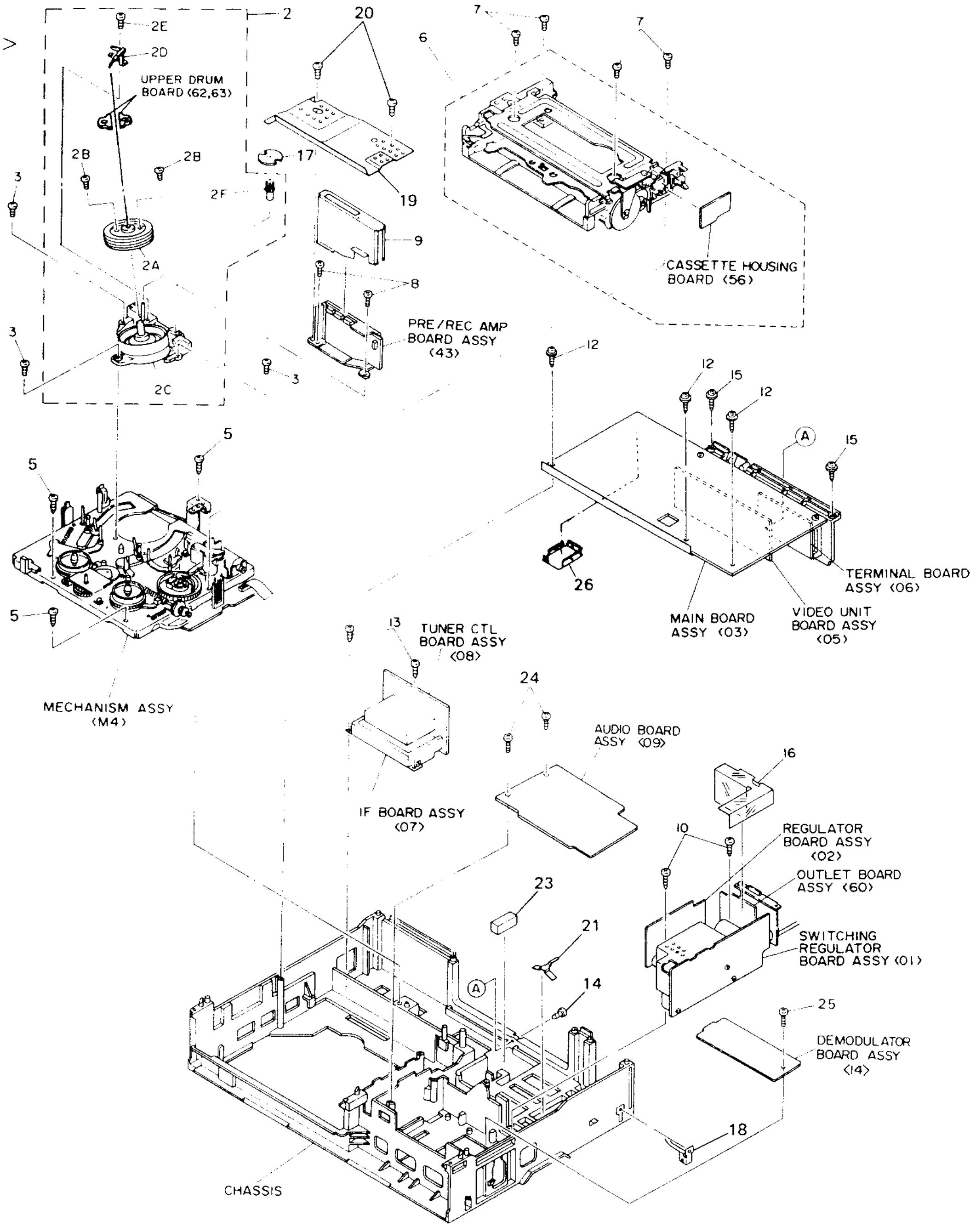
CABINET ASSEMBLY < M2 >

△ REF No.	PART No.	PART NAME, DESCRiPTION
1	PQ10916C-10	FRONT PANEL ASSY,E
1	PQ10916B-10	FRONT PANEL ASSY,EG
1A	PQ33082-2	BUTTON(STOP)
1B	PQ33081-2	BUTTON(POWER),EG
1B	PQ33081-3	BUTTON(POWER),E
1C	PQ44256	INDICATOR(POWER)
1D	PU60109	CATCHER
1E	PQ20858-5	CASSETTE HOUSING DOOR
1F	PQ43628-1-1	TORSION SPRING
1G	PQ32950-2-1	FILTER
1H	PQ32949-1-2	DISPLAY WINDOW
1J	PQ20938-3	COVER(FRONT),E
1J	PQ20938-2	COVER(FRONT),EG
1K	SDSF2005Z	SCREW, X2
1L	PQ33471	COVER(INDICATOR),EG
1L	PQ33471-2	COVER(INDICATOR),E
1P	PU60005	PUSH OPEN UNIT
1Q	PQ21062	PLATE(PROG.),EG
1Q	PQ21062-2	PLATE(PROG.),E
1R	PQ32964-2	EARTH PLATE
1S	PQ33172-1-1	EARTH PLATE
1T	PQ44563	BRACKET
1U	PQ44389	BRACKET
1W	SDSF2005Z	SCREW

#△ REF No.	PART No.	PART NAME, DESCRIPTION
2	PQ33091A-1	KNOB(JOG) ASSY
2A	PQ33087-1-1	KNOB(JOG)
3	PQ33088-2	KNOB(SHUTTLE)
4	PQ43456A-1	FOOT ASSY,X4
5	SDSF3012Z	SCREW,X4
△ 6	PQ10602-16	TOP COVER
7	PQ43930	SPECIAL SCREW,X4
8	SDSF2608Z	SCREW,X9
△ 9	PQ10712-1-5	BOTTOM COVER
10	SDSF3012Z	SCREW, X2, FOR BOTTOM COVER
11	PQ44257	KNOB(VOLUME),X3
12	PQ33137	KNOB(SLIDE),X2
13	PQ11036A	SIDE PANEL(L)SA
14	PQ11037A	SIDE PANEL(R)SA
16	SDSF3010M	SCREW
17	PQ20977B	UPPER D00R ASSY,EG
17	PQ20977C	UPPER D00R ASSY,E
18	PEME0797	MEMBRANE ASSY
19	PQ33149	EARTH PLATE
20	PQ20978B	LOWER DOOR ASSY,EG
20	PQ20978C	LOWER DOOR ASSY,E
21	SDSF2005Z	SCREW,X6
22	PEME0776	DAMP UNIT ASSY
23	SDSF2010Z	SCREW,X2
24	PEME0757-02	JOG SHUTTLE ASSY
25	SDSF2608Z	SCREW,X3

4.3 CHASSIS ASSEMBLY <M3>

BEWARE OF BOGUS PARTS
Parts that do not meet specifications may cause trouble in regard to safety and performance. We recommend that genuine JVC parts be used.



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2E
2D
UPPER DRUM BOARD (62,63)
2B
2B
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2F
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2A
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2C
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8
PRE/REC AMP BOARD ASSY (43)
3
CASSETTE HOUSING BOARD (56)
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26
TERMINAL BOARD ASSY (06)
MAIN BOARD ASSY (03)
VIDEO UNIT BOARD ASSY (05)
13
TUNER CTL BOARD ASSY (08)
MECHANISM ASSY (M4)
24
AUDIO BOARD ASSY (09)
16
IF BOARD ASSY (07)
10
REGULATOR BOARD ASSY (02)
OUTLET BOARD ASSY (60)
23
21
SWITCHING REGULATOR BOARD ASSY (01)
A
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25
DEMODULATOR BOARD ASSY (14)
18
CHASSIS

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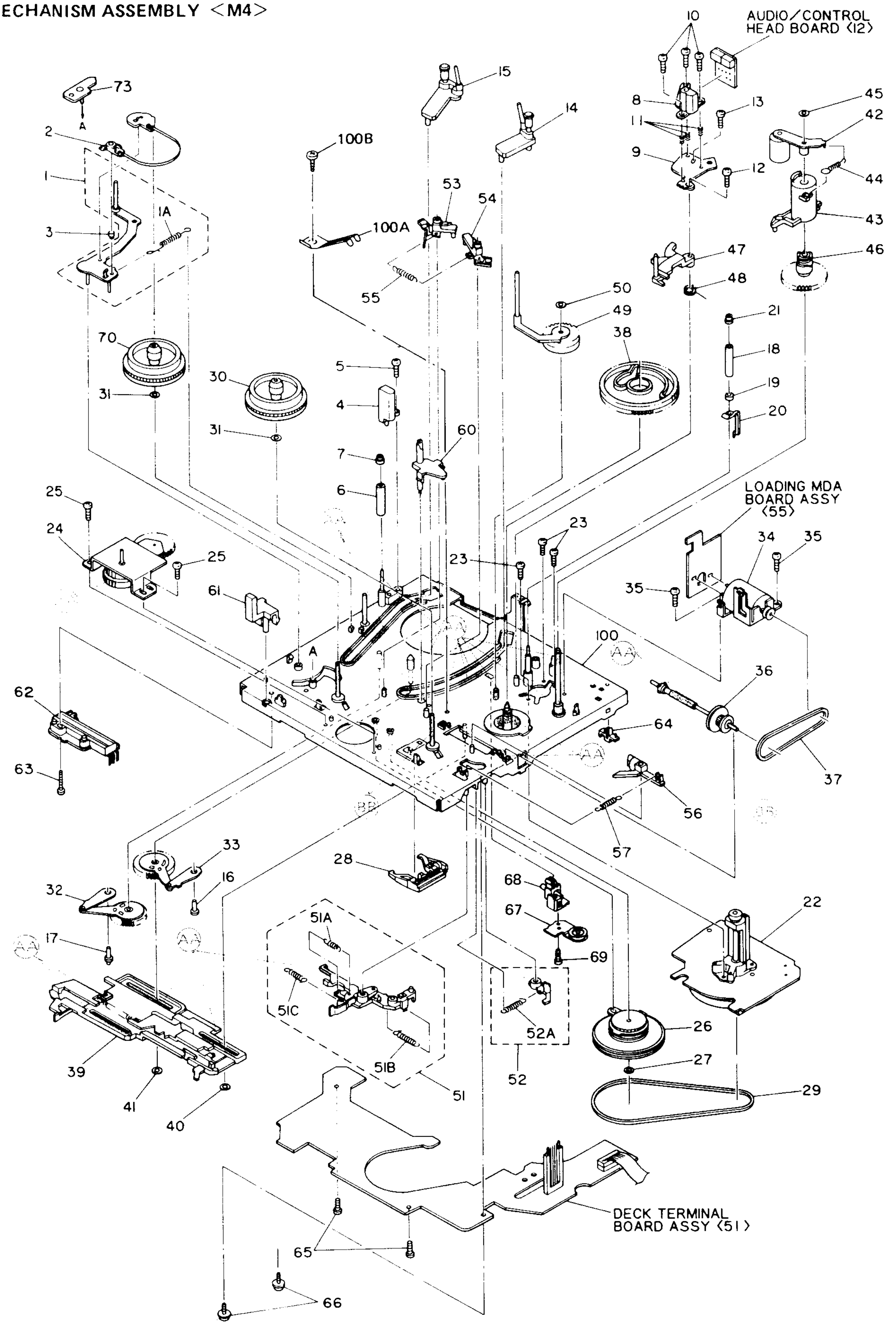
CHASSIS ASSEMBLY <M3>

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION
⚠	2	PDV2212A	DRUM ASSEMBLY
	2A	PDM2137A-2	UPPER DRUM ASSY
	2B	PDM4165A	DRUM SCREW ASSEMBLY, X2
	2C	PDM2138P	LOWER DRUM MOTOR ASSY
	2D	PDM4229A-1	BRUSH ASSY
	2E	SDSG2606Z	SCREW
	2F	PDM4226A	ROLLER ASSEMBLY
	3	SPST2610Z	SCREW, X3, FOR DRUM
	5	PQ43831	SPECIAL SCREW,X3,FOR MAIN DECK
	6	PUS29183B-7	CASSETTE HOUGING ASSY
	7	SDST2608Z	SCREW,X4,FOR CASSETTE HOUSING
	8	SDSG2606Z	SCREW, X2, FOR PRE/REC
	9	PQ33473	SHIELD CASE(2) ,FOR PRE/REC
	10	PQ43831	SPECIAL SCREW,X2,FOR P.TRANS
	12	GPSF2610Z	SCREW, X3, FOR MAIN BOARD
	13	SDSF3008Z	SCREW, X2, FOR TUNER UNIT
	14	SDSF3010M	SCREW, FOR TEARMINAL BOARD
	15	GPSF2610Z	SCREW,X2,FOR TEARMINAL BOARD
⚠	16	PQ44631	AC COVER,EG
	17	PQ44230	INERTIA PLATE
	18	PQ44679	EARTH PLATE
	19	PQ32387-1-4	DRUM SHIELD
	20	SDST2608Z	SCREW, X2, FOR DRUM SHIELD
	21	PQ43942	EARTH PLATE
	23	PQM30029-127	SPACER, FOR CHASSIS
	24	SDSF2610Z	SCREW, X2, FOR FMA
	25	SDSF2610Z	SCREW, FOR DEMOD
	26	PQ42582	PRE AMP SHIELD2

4.4 MECHANISM ASSEMBLY <M4>


10
AUDIO/CONTROL HEAD BOARD <12>
73
A
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1A
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100B
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100A
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23
LOADING MDA BOARD ASSY <55>
34
35
35
100
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51A
51C
51B
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52A
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DECK TERMINAL BOARD ASSY <51>
65
66
AA
BB

Category	Part number	MARK
Grease	KANTO-G-31KAV	AA
Oil	COSMO-HV56	BB

NOTE: The section marked in Ⓐⓐ and Ⓑⓑ indicate lubrication and greasing areas.

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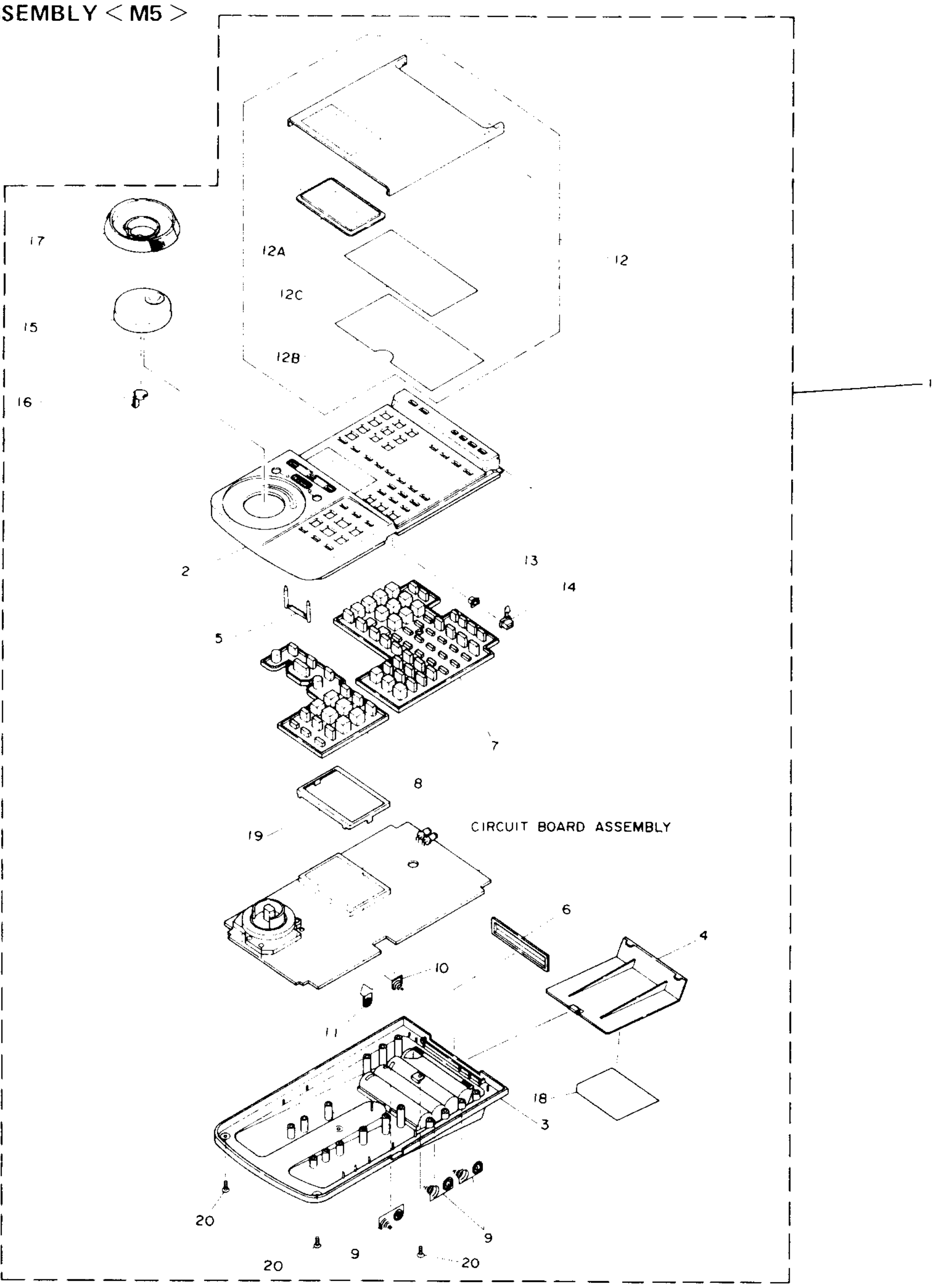
MECHANISM ASSEMBLY <M4>

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION
1	PQ43497E-8	TENSION ARM ASSY
1A	PQ43500	TENSION SPRING
2	PQ43501B	TENSION BAND ASSY
3	PQ43503-1-4	ADJUST PIN
4	PU60616	FULL ERASE HEAD
5	SDSF2614Z	SCREW
6	PQ43505-1-1	ROLLER
7	PQ43506	GUIDE POLE CAP
8	PU60617	AUDIO/CONTROL HEAD
9	PQ43509	HEAD BASE
10	PQ43687A	SPECIAL SCREW,X3
11	PQM30002-192	COMPRESSION SPRING,X3
12	SPSP2606Z	SCREW
13	SPSF2608M	SCREW
14	PU61103-2	POLE BASE ASSY(TU)
15	PU61151-2	POLE BASE ASSY(SUPPLY)
16	PQ43524	STOPPER
17	PQ43525	STOPPER 2
18	PQ43526-1-3	TAPE GUIDE
19	PQ43670-1-1	GUIDE FLANGE
20	PQ43675	TAPE GUARD
21	PQ43506	GUIDE POLE CAP
⚠ 22	PU61003	CAPSTAN MOTOR
23	SPSG2608Z	SCREW,X3
24	PU61004-1-3	IDLER GEAR UNIT
25	SPST2606Z	SCREW,X2
26	PU61005-1-4	CLUTCH UNIT
27	PQM30017-8	SLIT WASHER
28	PQ43532A-1	CHANGE LEVER ASSY
29	PU61006	TIMING BELT
30	PU60858	REEL DISK (TAKE-UP)
31	PQM30018-54	SPACER,X2
32	PQ43537A	LOADING ARM ASSY (SUPPLY)
33	PQ43542B	LOADING ARM ASSY (TAKE-UP)
34	PQ43676B-5	MODE MOTOR ASSY
	or PQ43676C	MODE MOTOR ASSY
35	SPST2606Z	SCREW,X2
36	PQ43548A-3	WORM CLUTCH ASSY
37	PQM30003-23	BELT(LOADING)
38	PQ20822-2-4	CONTROL CAM
39	PQ44326A-3	PLATE ASSY
40	PQM30017-12	SLIT WASHER
41	PQM30017-8	SLIT WASHER
42	PQ43921B-2	PINCH ROLLER ARM ASSY
	or PQ43921D-2	PINCH ROLLER ARM ASSY
43	PQ32415	PINCH ROLLER PRESS LEVER
44	PQM30001-233	TENSION SPRING
45	PQM30017-12	SLIT WASHER
46	PQ32416-2	PINCH ROLLER CAM
47	PQ43567A-8	GUIDE ARM ASSY
48	PQ43569-1-3	TORSION SPRING
49	PQ43570A	HALF LOADING GEAR ASSY
50	PQM30017-12	SLIT WASHER
51	PQ43575A-5	C.LEVER ASSY
51A	PQM30001-273	T.SPRING
51B	PQM30001-237	TENSION SPRING
51C	PQM30001-274	T.SPRING
52	PQ43578A-2	HOOK ASSY
52A	PQM30001-238	TENSION SPRING
53	PQ43581A-6	MAIN BRAKE ASSY (SUPPLY)
54	PQ43582A-2	MAIN BRAKE ASSY (TAKE-UP)
55	PQM30001-251	TENSION SPRING
56	PQ43583A	SUB BRAKE ASSY (TAKE-UP)
57	PQM30001-298	TENSION SPRING
60	PU60621-1-2	LED HOLDER(INC D1)
61	PU60624-1-4	REC SAFETY SWITCH(S2)
62	PU60973	SLIDE SWITCH(S3)
63	SDSF2614Z	SCREW
64	PQ32516	PWB HOLDER
65	SDST2616Z	SCREW,X2
66	GPSF2608Z	SCREW,X2
67	PQ43912A-5	PULLEY ARM ASSY
68	PQ32882	PULLEY BASE
69	SDSF2608Z	SCREW
70	PU60859	REEL DISK (SUPPLY)
73	PQ44246	TENSION BRACKET 3
100	PQ20650E-18	MAIN DECK ASSY
	or PQ20753D	MAIN DECK ASSY
100A	PQ43849	EARTH PLATE
100B	SPST2604Z	SCREW

4.5 REMOTE CONTROL ASSEMBLY < M5 >



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REMOTE CONTROLLER UNIT <M5>

#△ REF No.	PART No.	PART NAME, DESCRIPTION
△ 1	PQ10842L	REMOTE CONTROLLER,E
△ 1	PQ10842J-7	REMOTE CONTROLLER,EG
2	PQ10843-9	UPPER CASE, E
2	PQ10843-8-3	UPPER CASE,EG
3	PQ10844-2	LOWER CASE
4	PQ32866-2	BATTERY CAP
5	PQ43954	INDICATOR
6	PQ32870	IR WINDOW
7	PQ20824-11	BUTTON(1),E
7	PQ20824-10-2	BUTTON(1),EG
8	PQ20829-7	BUTTON(2),EG
8	PQ20829-3	BUTTON(2),E
9	PQ43933	TERMINAL(A),X3
10	PQ43934	TERMINAL(B)
11	PQ43935	TERMINAL(C)
12	PQ32871H	DOOR ASSY,E
12	PQ32871G-3	DOOR ASSY,EG
12A	PQ43936-2	LCD WINDOW
12B	PQ32874-6	SHEET(CLEAR)
12C	PQ32875-7	SHEET(PROGRAM),E
12C	PQ32875-8	SHEET(PROGRAM),EG
13	PQ43966	BUTTON(3)
14	PQ43967-2	BUTTON(OPEN)
15	PQ32906-2	JOG
16	PQ43969	SPACER(JOG)
17	PQ32907-2	SHUTTLE
18	PQ32552-5	LABEL(RATING)
19	PQ43845	HOLDER(LCD)
20	SSSF2008M	SCREW,X3

SECTION 5
ELECTRICAL PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION

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POWER SUPPLY BOARD ASSEMBLY<01><02>

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION
	PWBA	PB20439E-01	POWER SUPPLY BOARD ASSEMBLY
⚠	BKT1	PQ20971-2	TRANS BRACKET
⚠	POC1	QMP3980-200	POWER CORD
⚠	HD1	QHS3771-108	STRAIN RELIEF
	SCW1	SDST3006Z	SCREW,X4
	SLD1	PQ33261-1-1	SHIELD CASE (1)
	SLD2	PQ33262	SHIELD CASE (2)

- SWITCH REGULATOR BOARD ASSEMBLY<01> -

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	PWBA1	PB20439E1-01	SW.REG BOARD ASSEMBLY	
	IC1	LM358N	IC	
		or LM358P	IC	
		or BA10358	IC	
	Q1	2SC4517A-LF619	TRANSISTOR	
	Q2	2SC3616(MLK)	TRANSISTOR	
	Q5	2SB941P	TRANSISTOR	
		or 2SA1488	TRANSISTOR	
	Q6	2SA720	TRANSISTOR	
	D1	10E6-F2	DIODE	
	D2	10E6-F2	DIODE	
	D3	10E6-F2	DIODE	
	D4	10E6-F2	DIODE	
	D5	AU01	FR DIODE	
	D6	AU01	FR DIODE	
	D7	MTZ27BT-77	ZENER DIODE	
	D8	AU01Z	FR DIODE	
		or ERA48-02	FR DIODE	
		or 1SR153-200-T2	FR DIODE	
	D14	AU01Z	FR DIODE	
		or ERA48-02	FR DIODE	
		or 1SR153-200-T2	FR DIODE	
	D15	11EFS2	FR DIODE	
	D16	FML-12S	FR DIODE	
		or F6P20F	FR DIODE	
	D17	FMB-24	BARRIER DIODE	
		or F5KQ40B	BARRIER DIODE	
	D18	AU01Z	FR DIODE	
		or ERA48-02	FR DIODE	
		or 1SR153-200-T2	FR DIODE	
	D19	MTZ30AT-77	ZENER DIODE	
	D20	RD8.2ES-T1B1	ZENER DIODE	
		or UZ8.2BSA	ZENER DIODE	
	D21	AK04	DIODE	
	D22	MTZV6.2A	ZENER DIODE	
	D23	AK04	DIODE	
	D29	RD15ES-T1B1	ZENER DIODE	
	R1	QRZ0078-2R2	W.W.RESISTOR	2.2Ω
	R2	QRD161J-334	RESISTOR	330KΩ,1/6W
	R3	QRD161J-334	RESISTOR	330KΩ,1/6W
	R4	QRD161J-563	RESISTOR	56KΩ,1/6W
	R5	QRG029J-683G	OMF RESISTOR	68KΩ,2W
	R6	QRG029J-241G	OMF RESISTOR	240Ω,2W
	R7	QRD161J-122	RESISTOR	1.2KΩ,1/6W
	R8	QRD161J-471	RESISTOR	470Ω,1/6W
	R9	QRX014J-R33	MF RESISTOR	0.33Ω,1W
	R10	QRG029J-303A	OMF RESISTOR	30KΩ,2W
	R17	QRD161J-221	RESISTOR	220Ω,1/6W
	R18	QRD161J-102	RESISTOR	1KΩ,1/6W
	R19	QRV144F-1071A	CMF RESISTOR	1.07KΩ,1/4W
	R20	QRV144F-1001A	CMF RESISTOR	1KΩ,1/4W
⚠	R21	QRZ0077-470X	FUSIBLE RESISTOR	47Ω
	R22	QRD161J-333	RESISTOR	33KΩ,1/6W
	R23	QRD161J-471	RESISTOR	470Ω,1/6W
	R24	QRV144F-4023A	RESISTOR	402KΩ,1/4W
	R25	QRV144F-1002A	CMF RESISTOR	10.0KΩ,1/4W
	R26	QRV144F-1182A	CMF RESISTOR	11.8KΩ,1/4W
	R28	QRD161J-331	RESISTOR	330Ω,1/6W
	R29	QRD161J-103	RESISTOR	10KΩ,1/6W
	R30	QRD161J-222	RESISTOR	2.2KΩ,1/6W
⚠	C1	QFZ9022-333	MM CAPACITOR	0.033μF

⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
⚠	C2	QFZ9022-333	MM CAPACITOR	0.033μF
⚠	C3	QFZ9022-333	MM CAPACITOR	0.033μF
⚠	C6	QCZ9016-222M	CAPACITOR	0.0022μF
⚠	C7	QCZ9016-222M	CAPACITOR	0.0022μF
⚠	C8	QCZ9016-222M	CAPACITOR	0.0022μF
⚠	C9	QCZ9016-222M	CAPACITOR	0.0022μF
⚠	C10	QCZ9016-222M	CAPACITOR	0.0022μF
⚠	C11	QCZ9016-222M	CAPACITOR	0.0022μF
	C12	QEZ0147-107	E CAPACITOR	100μF
		or QEZ0170-107	E CAPACITOR	100μF
		or QEZ0111-107	E CAPACITOR	100μF
	C13	QCY53AK-472	CAPACITOR	0.0047μF,1000V
		or QCZ0212-472	CAPACITOR	0.0047μF
	C14	QCZ0212-101	CAPACITOR	100PF
	C16	QFL41HJ-682	M CAPACITOR	0.0068μF,50V
	C17	QETC1HM-475	E CAPACITOR	4.7μF,50V
	C18	QETC1JM-336	E CAPACITOR	33μF,63V
	C19	QEZ0125-477	E CAPACITOR	470μF
		or QEZ0138-477	E CAPACITOR	470μF
	C20	QETC1EM-337	E CAPACITOR	330μF,25V
	C21	QEMB1CM-158	E CAPACITOR	1500μF,16V
	C22	QETB1CM-108	E CAPACITOR	1000μF,16V
	C23	QFL41HJ-102	M CAPACITOR	0.001μF,50V
	C24	QEZ0136-228	E CAPACITOR	2200μF
		or QEZ0106-228	E CAPACITOR	2200μF
	C25	QETC1HM-476	E CAPACITOR	47μF,50V
	C26	QETC1VM-336	E CAPACITOR	33μF,35V
	C27	QFL41HJ-103	M CAPACITOR	0.01μF,50V
	C28	QEZ0156-127Z	E CAPACITOR	120μF
		or QEZ0135-127Z	E CAPACITOR	120μF
	C29	QETC0JM-107	E CAPACITOR	100μF,6.3V
	C30	QFL41HJ-103	M CAPACITOR	0.01μF,50V
	C33	QETC1VM-226	E CAPACITOR	22μF,35V
	C50	QFL41HJ-122	M CAPACITOR	0.0012μF,50V
	C52	QCZ9016-101K	CAPACITOR	100PF
	C53	QCZ9016-101K	CAPACITOR	100PF
	C55	QFV11HJ-124	MMT CAP	0.12μF,50V
	L1	PU60943-330K	COIL	33μH
	L2	PU60943-100M	COIL	10μH
	L3	PU60943-330K	COIL	33μH
	L4	PU48530-100K	COIL	10μH
	PHS1	PC111S	PHOTO COUPLER	
	T1	PELN0301	SWITCHING TRANS	
	HD1	PU57505	FUSE CLIP,X2	

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
⚠	HS1	PQ44610-1-1	HEAT SINK,FOR Q1	
	HS2	PQ44724	HEAT SINK,FOR D16,D17	
⚠	LF1	PU61108	LINE FILTER	
⚠		or PU60347	LINE FILTER	
⚠	LF2	PU59707	LINE FILTER	
⚠		or PELN0255	LINE FILTER	
	SCW1	SDSG3008Z	SCREW,X2	
⚠	SCW2	SDSG3006Z	SCREW	
	SCW3	SDSG3008Z	SCREW,X2,FOR D16,D17	
	SCW4	SDSG3006Z	SCREW,FOR HEAT SINK	
⚠	SLD1	PQ44698	INSULATOR	
	SPC1	PU57215-2	SPACER	
	CN1	PU58844-107	CAP HOUSING	
	CN2	PU58844-9	CAP HOUSING	
⚠	CP1	ICP-N5	CIRCUIT PROTECTOR	
⚠	CP2	ICP-N20	CIRCUIT PROTECTOR	
⚠	F1	QMF51E2-1R0	FUSE	T1A
⚠		or QMF51E2-1R0J1	FUSE	T1A

– REGULATOR BOARD ASSEMBLY<02> –

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION
	PWBA2	PB20439E2-01	REGULATOR BOARD ASSEMBLY
	IC2	UPC24M05HF	IC
	Q7	2SB1425(EU)	TRANSISTOR
	Q8	2SC1740S	TRANSISTOR
	Q9	2SB941P	TRANSISTOR
		or 2SA1488	TRANSISTOR
	Q10	2SC1740S(Q)	TRANSISTOR
	Q11	2SC1740S	TRANSISTOR
	Q12	2SA933S	TRANSISTOR
		or 2SA1267(YG)-TJK	TRANSISTOR
	Q13	DTB114ES	TRANSISTOR

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	D25	1SS133	DIODE	
		or MA165	DIODE	
	D26	UZ5.1BSC	ZENER DIODE	
		or RD5.1ES-T1B3	ZENER DIODE	
		or MTZV5.1C	ZENER DIODE	
	D27	1SS133	DIODE	
		or MA165	DIODE	
	R31	QRD161J-102	RESISTOR	1KΩ,1/6W
	R32	QRD161J-103	RESISTOR	10KΩ,1/6W
	R33	QRD161J-221	RESISTOR	220Ω,1/6W
	R34	QRD161J-822	RESISTOR	8.2KΩ,1/6W
	R35	QRD161J-471	RESISTOR	470Ω,1/6W
	R36	QRD161J-103	RESISTOR	10KΩ,1/6W
	R37	QVZ3518-471AZ	V RESISTOR,DC 5V	470Ω
		or QVZ3523-471AZ	V RESISTOR,DC 5V	470Ω
	R38	QRD161J-472	RESISTOR	4.7KΩ,1/6W
	R39	QRD161J-102	RESISTOR	1KΩ,1/6W
	R40	QRD161J-103	RESISTOR	10KΩ,1/6W
⚠	R41	QRZ0077-220X	FUSIBLE RESISTOR	22Ω
	R50	QRD161J-102	RESISTOR	1KΩ,1/6W
	R51	QRD161J-102	RESISTOR	1KΩ,1/6W
	R52	QRD161J-222	RESISTOR	2.2KΩ,1/6W
	C34	QETC1JM-226	E CAPACITOR	22μF,63V
	C35	QETC1CM-107	E CAPACITOR	100μF,16V
	C36	QETC0JM-107	E CAPACITOR	100μF,6.3V
	C37	QETC1CM-107	E CAPACITOR	100μF,16V
	C38	QETC1AM-107	E CAPACITOR	100μF,10V
	C39	QETB1AM-228	E CAPACITOR	2200μF,10V
	C40	QFL41HJ-103	MY CAPACITOR	0.01μF,50V
	C41	QETC0JM-107	E CAPACITOR	100μF,6.3V
	C43	QFL41HJ-103	MY CAPACITOR	0.01μF,50V
	C44	QETC0JM-107	E CAPACITOR	100μF,6.3V
	C51	QETC1CM-476	E CAPACITOR	47μF,16V
	TP1	PU54983	TEST PIN,X3,(TP1-3)	
	CN3	PU58844-109	CAP HOUSING	
	CN4	PU60910-112	CAP HOUSING	
⚠	CP3	ICP-N20	CIRCUIT PROTECTOR	
⚠	CP4	ICP-N38	CIRCUIT PROTECTOR	
⚠	CP5	ICP-N38	CIRCUIT PROTECTOR	

- OUTLET BOARD ASSEMBLY <60> -

REF No.	PART No.	PART NAME, DESCRIPTION
PWBA3	PB20439E3	OUTLET BOARD ASSEMBLY

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	D28	1SS133	DIODE	
		or MA165	DIODE	
⚠	RY1	PESW0555	RELAY	
⚠	AO1	QMC9021-001	AC OUTLET	
⚠	HD1	PU57505	FUSE CLIP,X2	
⚠	TAB1	A74316	TAB	
	CN8	PU58844-102	CAP HOUSING	
⚠	F2	QMF51E2-2R0	FUSE	T2A
⚠		or QMF51E2-2R0J1	FUSE	T2A

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MAIN BOARD ASSEMBLY <03>

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION
	PWBA	PB10397J	MAIN BOARD ASSY,EG
	PWBA	PB10397K	MAIN BOARD ASSY,E
⚠	TB1	PQ20996-7	TERMINAL BOARD,EG
⚠	TB1	PQ20996-9	TERMINAL BOARD,E
⚠	RF1	PU59980M-6	RF CONVERTER/MIX BOOSTER
	CL2	PU59311-4	WIRE CLAMP,X2
	BKT1	PQ32369	BRACKET
	CL3	PU56729-2	WIRE CLAMP

#△ REF No.	PART No.	PART NAME, DESCRIPTION
ETH1	PQ43012-1-1	EARTH PLATE
RV1	PU56800	NYLON RIVET
SCW1	SDST2605Z	SCREW
SCW2	SDSF2608Z	SCREW,X2
SPC1	PU60010	SPACER
WR1	PW30401-BB19T	COAXIAL CORD
	or PW30402-BB19M	COAXIAL CORD
	or PW30401-BB19S	COAXIAL CORD
J701	PU60612	EARPHONE JACK
	or PU61012	EARPHONE JACK,(MINI JACK)
J702	PU60612	EARPHONE JACK
	or PU61012	EARPHONE JACK,(MINI JACK)
TP205	PU57545	TEST PIN,X13

- VIDEO SECTION -

#△ REF No.	PART No.	PART NAME, DESCRIPTION
IC361	TC4538BP	IC
Q201	DTC114WS	TRANSISTOR
Q202	DTC144WS	TRANSISTOR
Q203	2SA933S(RS)	TRANSISTOR
	or 2SA1267(YG)-TJK	TRANSISTOR
Q204	2SC1740S(RS)	TRANSISTOR
	or 2SC3199(GB)-TJK	TRANSISTOR
Q205	2SC1740S(RS)	TRANSISTOR
	or 2SC3199(GB)-TJK	TRANSISTOR
Q206	2SC1740S(RS)	TRANSISTOR
	or 2SC3199(GB)-TJK	TRANSISTOR
Q207	2SA933S(RS)	TRANSISTOR
	or 2SA1267(YG)-TJK	TRANSISTOR
Q208	2SA933S(RS)	TRANSISTOR
	or 2SA1267(YG)-TJK	TRANSISTOR
Q209	DTA114ES	TRANSISTOR
Q210	2SA854S(QR)	TRANSISTOR
Q303	2SC1740S(RS)	TRANSISTOR
	or 2SC3199(GB)-TJK	TRANSISTOR
Q304	DTC124ES	TRANSISTOR
Q305	DTC124ES	TRANSISTOR
Q308	DTA124ES	TRANSISTOR
Q309	DTC114WS	TRANSISTOR
Q310	DTC144ES	TRANSISTOR

#△ REF No.	PART No.	PART NAME, DESCRIPTION
Q351	2SA933S(RS)	TRANSISTOR
	or 2SA1267(YG)-TJK	TRANSISTOR
Q361	2SC1740S(RS)	TRANSISTOR
	or 2SC3199(GB)-TJK	TRANSISTOR
Q362	2SC1740S(RS)	TRANSISTOR
	or 2SC3199(GB)-TJK	TRANSISTOR
Q363	2SC1740S(RS)	TRANSISTOR
	or 2SC3199(GB)-TJK	TRANSISTOR
Q364	2SC1740S(RS)	TRANSISTOR
	or 2SC3199(GB)-TJK	TRANSISTOR
Q365	2SC1740S(RS)	TRANSISTOR
	or 2SC3199(GB)-TJK	TRANSISTOR
Q366	2SC1740S(RS)	TRANSISTOR
	or 2SC3199(GB)-TJK	TRANSISTOR
Q367	DTC144ES	TRANSISTOR
Q368	2SA933S(RS)	TRANSISTOR
	or 2SA1267(YG)-TJK	TRANSISTOR
Q369	DTC114WS	TRANSISTOR
D201	1SS133	DIODE
	or MA165	DIODE
D202	1SS133	DIODE
	or MA165	DIODE
D204	1SS133	DIODE
	or MA165	DIODE
D205	1SS133	DIODE
	or MA165	DIODE
D206	1SS133	DIODE
	or MA165	DIODE
D207	1SS133	DIODE
	or MA165	DIODE
D210	1SS133	DIODE
	or MA165	DIODE
D212	1SS133	DIODE
	or MA165	DIODE
D213	1SS133	DIODE
	or MA165	DIODE
D304	1SS133	DIODE
	or MA165	DIODE
D306	1SS133	DIODE
	or MA165	DIODE
D307	1SS133	DIODE
	or MA165	DIODE
D308	1SS133	DIODE
	or MA165	DIODE
D309	1SS133	DIODE
	or MA165	DIODE
D310	1SS133	DIODE
	or MA165	DIODE
D311	1SS133	DIODE
	or MA165	DIODE
D343	1SS133	DIODE
	or MA165	DIODE
D361	1SS133	DIODE
	or MA165	DIODE

#△ REF No.	PART No.	PART NAME, DESCRIPTION	
D362	1SS133	DIODE	
	or MA165	DIODE	
D363	MA29W(A)	DIODE	
D364	1SS133	DIODE	
	or MA165	DIODE	
D365	1SS133	DIODE	
	or MA165	DIODE	
D366	1SS133	DIODE	
	or MA165	DIODE	
D367	1SS133	DIODE	
	or MA165	DIODE	
D368	1SS133	DIODE	
	or MA165	DIODE	
D369	1SS133	DIODE	
	or MA165	DIODE	
D370	1SS133	DIODE	
	or MA165	DIODE	
D371	1SS133	DIODE	
	or MA165	DIODE	
D372	1SS133	DIODE	
	or MA165	DIODE	
D373	1SS133	DIODE	
	or MA165	DIODE	
D374	1SS133	DIODE	
	or MA165	DIODE	
D375	1SS133	DIODE	
	or MA165	DIODE	
D376	1SS133	DIODE	
	or MA165	DIODE	
D377	1SS133	DIODE	
	or MA165	DIODE	
D378	1SS133	DIODE	
	or MA165	DIODE	
D379	1SS133	DIODE	
	or MA165	DIODE	
R201	QRD161J-152	RESISTOR	1.5KΩ,1/6W
R202	QRD161J-103	RESISTOR	10KΩ,1/6W
R204	QRD161J-822	RESISTOR	8.2KΩ,1/6W
R205	QRD161J-472	RESISTOR	4.7KΩ,1/6W
R206	QRD161J-562	RESISTOR	5.6KΩ,1/6W
R207	QRD161J-222	RESISTOR	2.2KΩ,1/6W
R208	QRD161J-182	RESISTOR	1.8KΩ,1/6W
R209	QRD161J-222	RESISTOR	2.2KΩ,1/6W
R210	QRD161J-222	RESISTOR	2.2KΩ,1/6W
R211	QRD161J-182	RESISTOR	1.8KΩ,1/6W
R212	QRD161J-102	RESISTOR	1KΩ,1/6W
R213	QRD161J-102	RESISTOR	1KΩ,1/6W
R215	QRD161J-471	RESISTOR	470Ω,1/6W
R216	QRD161J-561	RESISTOR	560Ω,1/6W
R217	QRD161J-222	RESISTOR	2.2KΩ,1/6W
R218	QRD161J-153	RESISTOR	15KΩ,1/6W
R219	QRD161J-103	RESISTOR	10KΩ,1/6W
R220	QVZ3518-681AZ	V RESISTOR, SP REC COLOUR	680Ω
	or QVZ3523-681AZ	V RESISTOR, SP REC COLOUR	680Ω
R221	QRD161J-122	RESISTOR	1.2KΩ,1/6W
R222	QRD161J-333	RESISTOR	33KΩ,1/6W

#△ REF No.	PART No.	PART NAME, DESCRIPTION	
R223	QRD161J-183	RESISTOR	18KΩ,1/6W
R224	QRD161J-152	RESISTOR	1.5KΩ,1/6W
R225	QRD161J-681	RESISTOR	680Ω,1/6W
R226	QVZ3518-332AZ	V RESISTOR,SP FREQ	3.3KΩ
	or QVZ3523-332AZ	V RESISTOR,SP FREQ	3.3KΩ
R227	QRD161J-101	RESISTOR	100Ω,1/6W
R228	QRD161J-182	RESISTOR	1.8KΩ,1/6W
R229	QRD161J-123	RESISTOR	12KΩ,1/6W
R230	QRD161J-103	RESISTOR	10KΩ,1/6W
R231	QRD123J-391SX	RESISTOR	390Ω,1/2W
R232	QRD161J-472	RESISTOR	4.7KΩ,1/6W
R233	QRD161J-682	RESISTOR	6.8KΩ,1/6W
R234	QRD161J-101	RESISTOR	100Ω,1/6W
R235	QRD161J-102	RESISTOR	1KΩ,1/6W
R236	QRD161J-102	RESISTOR	1KΩ,1/6W
R237	QRD161J-222	RESISTOR	2.2KΩ,1/6W
R238	QRD161J-750	RESISTOR	75Ω,1/6W
R239	QRD161J-750	RESISTOR	75Ω,1/6W
R240	QRD161J-102	RESISTOR	1KΩ,1/6W
R243	QRD161J-103	RESISTOR	10KΩ,1/6W
R244	QRD161J-222	RESISTOR	2.2KΩ,1/6W
R245	QRD161J-681	RESISTOR	680Ω,1/6W
R250	QRD161J-471	RESISTOR	470Ω,1/6W
R309	QRD161J-103	RESISTOR	10KΩ,1/6W
R310	QRD161J-153	RESISTOR	15KΩ,1/6W
R311	QVZ3518-681AZ	V RESISTOR, LP REC COLOUR	680Ω
	or QVZ3523-681AZ	V RESISTOR, LP REC COLOUR	680Ω
R312	QRD161J-821	RESISTOR	820Ω,1/6W
R313	QVZ3518-332AZ	V RESISTOR, LP FREQ	3.3KΩ
	or QVZ3523-332AZ	V RESISTOR, LP FREQ	3.3KΩ
R314	QRD161J-103	RESISTOR	10KΩ,1/6W
R316	QRD161J-682	RESISTOR	6.8KΩ,1/6W
R317	QRD161J-223	RESISTOR	22KΩ,1/6W
R351	QRD161J-272	RESISTOR	2.7KΩ,1/6W
R361	ERS-A39J-102	THERMISTOR	
R362	QRD161J-122	RESISTOR	1.2KΩ,1/6W
R363	QRD161J-152	RESISTOR	1.5KΩ,1/6W
R364	QRD161J-153	RESISTOR	15KΩ,1/6W
R365	QRD161J-103	RESISTOR	10KΩ,1/6W
R366	QRD161J-472	RESISTOR	4.7KΩ,1/6W
R367	QRD161J-393	RESISTOR	39KΩ,1/6W
R368	QRD161J-821	RESISTOR	820Ω,1/6W
R369	QRD161J-511	RESISTOR	510Ω,1/6W
R370	QRD161J-391	RESISTOR	390Ω,1/6W
R371	QRD161J-332	RESISTOR	3.3KΩ,1/6W
R372	QRD161J-103	RESISTOR	10KΩ,1/6W
R373	QRD161J-392	RESISTOR	3.9KΩ,1/6W
R374	QRD161J-393	RESISTOR	39KΩ,1/6W
R375	QRD161J-273	RESISTOR	27KΩ,1/6W
R376	QRD161J-183	RESISTOR	18KΩ,1/6W
R377	QRD161J-684	RESISTOR	680KΩ,1/6W
R378	QRD161J-392	RESISTOR	3.9KΩ,1/6W
R379	QRD161J-273	RESISTOR	27KΩ,1/6W
R380	QRD161J-183	RESISTOR	18KΩ,1/6W
R381	QRD161J-102	RESISTOR	1KΩ,1/6W

△ REF No.	PART No.	PART NAME, DESCRIPTION	
R382	QRD161J-152	RESISTOR	1.5KΩ,1/6W
R383	QRD161J-182	RESISTOR	1.8KΩ,1/6W
R384	QRD161J-563	RESISTOR	56KΩ,1/6W
R385	QVZ3518-153AZ	V RESISTOR, FADER TIMING	15KΩ
	or QVZ3523-153AZ	V RESISTOR, FADER TIMING	15KΩ
R386	QRD161J-682	RESISTOR	6.8KΩ,1/6W
R387	QRD161J-123	RESISTOR	12KΩ,1/6W
R388	QRD161J-332	RESISTOR	3.3KΩ,1/6W
R389	QRD161J-682	RESISTOR	6.8KΩ,1/6W
R390	QRD161J-103	RESISTOR	10KΩ,1/6W
C201	QEN61AM-226	NP E CAPACITOR	22μF,10V
	or QENC1AM-226	NP E CAPACITOR	22μF,10V
C202	QCVB1CN-103	CAPACITOR	0.01μF,16V
C203	QCVB1CN-103	CAPACITOR	0.01μF,16V
C204	QCVB1CN-103	CAPACITOR	0.01μF,16V
C205	QCBB1HJ-121	CAPACITOR	120PF,50V
C206	QCBB1HJ-121	CAPACITOR	120PF,50V
C207	QCVB1CN-103	CAPACITOR	0.01μF,16V
C208	QCVB1CN-103	CAPACITOR	0.01μF,16V
C209	QETC0JM-476	E CAPACITOR	47μF,6.3V
C210	QCVB1CN-103	CAPACITOR	0.01μF,16V
C211	QCVB1CN-103	CAPACITOR	0.01μF,16V
C212	QETC0JM-476	E CAPACITOR	47μF,6.3V
C213	QCVB1CN-103	CAPACITOR	0.01μF,16V
C214	QCVB1CN-103	CAPACITOR	0.01μF,16V
C215	QCSB1HJ-390	CAPACITOR	39PF,50V
C216	QETC1CM-476	E CAPACITOR	47μF,16V
C217	QCVB1CN-103	CAPACITOR	0.01μF,16V
C218	QETC0JM-477	E CAPACITOR	470μF,6.3V
C219	QETC0JM-476	E CAPACITOR	47μF,6.3V
C220	QCC31CJ-473	CAPACITOR	0.047μF,16V
C221	QETC1HM-474	E CAPACITOR	0.47μF,50V
C222	QETC1HM-105	E CAPACITOR	1μF,50V
C224	QCBB1HJ-102	CAPACITOR	0.001μF,50V
C225	QCFB1EZ-223	CAPACITOR	0.022μF,25V
C230	QCBB1HJ-102	CAPACITOR	0.001μF,50V
C240	QCC31CJ-333	CAPACITOR	0.033μF,16V
C250	QCSB1HJ-560	CAPACITOR	56PF,50V
C302	QCSB1HJ-470	CAPACITOR	47PF,50V
C303	QCVB1CN-103	CAPACITOR	0.01μF,16V
C341	QCC31CJ-682	CAPACITOR	0.0068μF,16V
C351	QCVB1CN-103	CAPACITOR	0.01μF,16V
C361	QETC0JM-476	E CAPACITOR	47μF,6.3V
C362	QCVB1CN-103	CAPACITOR	0.01μF,16V
C363	QETC1EM-475	E CAPACITOR	4.7μF,25V
C364	QCBB1HJ-221	CAPACITOR	220PF,50V
C365	QETC1HM-335	E CAPACITOR	3.3μF,50V
C366	QETC0JM-476	E CAPACITOR	47μF,6.3V
C367	QCVC1CN-103	CAPACITOR	0.01μF,16V
C368	QFN31HJ-821	M CAPACITOR	820PF,50V
C369	QCBB1HJ-221	CAPACITOR	220PF,50V

#△ REF No.	PART No.	PART NAME, DESCRIPTION	
C370	QETC0JM-476	E CAPACITOR	47μF,6.3V
C371	QCVB1CN-103	CAPACITOR	0.01μF,16V
L201	PU59152-221J	COIL	220μH
L202	PU59152-560J	COIL	56μH
L203	PU48530-101K	COIL	100μH
L204	PU48530-101K	COIL	100μH
L205	PU59152-180J	COIL	18μH
L206	PU48530-101K	COIL	100μH
L207	PU54710-222	COIL	2.2mH
L208	PU59152-R22J	COIL	0.22μH
L305	PU59152-120J	COIL	12μH
L341	PU48530-821J	COIL	820μH
L361	PU48530-101K	COIL	100μH
L362	PU48530-101K	COIL	100μH
EQ201	PU54838	EQUALIZER	
	or PU60714	EQUALIZER	
CN204	PU58844-6	CAP HOUSING	
CN205	PU59555-6	CAP HOUSING	
CN206	PU58844-2	CAP HOUSING	
CN701	PU58844-6	CAP HOUSING	

- SERVO SECTION -

IC401	HD49733NT	IC	
	or HD49733ANT	IC	
IC501	BA7039	IC	
	or XRA7039	IC	
Q402	2SA1309(QRS)	TRANSISTOR	
	or 2SA1267(YG)-TJK	TRANSISTOR	
	or 2SA933S(QRS)	TRANSISTOR	
D401	1SS133	DIODE	
	or MA165	DIODE	
D402	1SS133	DIODE	
	or MA165	DIODE	
D403	1SS133	DIODE	
	or MA165	DIODE	
D404	1SS133	DIODE	
	or MA165	DIODE	
D407	1SS133	DIODE	
	or MA165	DIODE	
D408	1SS133	DIODE	
	or MA165	DIODE	

#△ REF No.	PART No.	PART NAME, DESCRIPTION	
D409	1SS133	DIODE	
	or MA165	DIODE	
D410	1SS133	DIODE	
	or MA165	DIODE	
R401	QRD161J-223	RESISTOR	22KΩ,1/6W
R402	QRD161J-225	RESISTOR	2.2MΩ,1/6W
R403	QRD161J-683	RESISTOR	68KΩ,1/6W
R404	QRD161J-222	RESISTOR	2.2KΩ,1/6W
R405	QRD161J-123	RESISTOR	12KΩ,1/6W
R406	QRD161J-472	RESISTOR	4.7KΩ,1/6W
R407	QRD161J-392	RESISTOR	3.9KΩ,1/6W
R408	QRD161J-105	RESISTOR	1MΩ,1/6W
R409	QRD161J-273	RESISTOR	27KΩ,1/6W
R411	QRD161J-105	RESISTOR	1MΩ,1/6W
R412	QRD161J-273	RESISTOR	27KΩ,1/6W
R413	QRD161J-273	RESISTOR	27KΩ,1/6W
R414	QRD161J-335	RESISTOR	3.3MΩ,1/6W
R415	QRD161J-334	RESISTOR	330KΩ,1/6W
R416	QRD161J-822	RESISTOR	8.2KΩ,1/6W
R417	QRD161J-332	RESISTOR	3.3KΩ,1/6W
R418	QRD161J-102	RESISTOR	1KΩ,1/6W
R419	QRD161J-473	RESISTOR	47KΩ,1/6W
R420	QVZ3518-684	V RESISTOR,SP SW POINT ADJ	680KΩ
R422	QRD161J-104	RESISTOR	100KΩ,1/6W
R426	QRD161J-821	RESISTOR	820Ω,1/6W
R427	QRD161J-102	RESISTOR	1KΩ,1/6W
R428	QRD161J-105	RESISTOR	1MΩ,1/6W
R429	QRD161J-102	RESISTOR	1KΩ,1/6W
R430	QRD161J-102	RESISTOR	1KΩ,1/6W
R434	QRD161J-102	RESISTOR	1KΩ,1/6W
R435	QRD161J-102	RESISTOR	1KΩ,1/6W
R436	QRD161J-274	RESISTOR	270KΩ,1/6W
R437	QRD161J-274	RESISTOR	270KΩ,1/6W
R438	QRD161J-224	RESISTOR	220KΩ,1/6W
R439	QRD161J-103	RESISTOR	10KΩ,1/6W
R440	QRD161J-474	RESISTOR	470KΩ,1/6W
R441	QRD161J-823	RESISTOR	82KΩ,1/6W
R501	QRD161J-102	RESISTOR	1KΩ,1/6W
R502	QRD161J-332	RESISTOR	3.3KΩ,1/6W
R503	QRD161J-682	RESISTOR	6.8KΩ,1/6W
R505	QRD161J-822	RESISTOR	8.2KΩ,1/6W
R506	QRD161J-102	RESISTOR	1KΩ,1/6W
R508	QRD161J-124	RESISTOR	120KΩ,1/6W
C401	QCVB1CM-103	CAPACITOR	0.01μF,16V
C402	QEK61AM-226	E CAPACITOR	22μF,10V
C403	QFV11HJ-224	TF CAPACITOR	0.22μF,50V
C404	QCC31CK-682	CAPACITOR	0.0068μF,16V
C405	QEK61EM-475	E CAPACITOR	4.7μF,25V
C406	QEK61EM-475	E CAPACITOR	4.7μF,25V
C407	QEK61CM-106	E CAPACITOR	10μF,16V
C408	QEK61CM-106	E CAPACITOR	10μF,16V

#△ REF No.	PART No.	PART NAME, DESCRIPTION	
C409	QCC31CK-223	CAPACITOR	0.022μF,16V
C410	QFV71HJ-184	TF CAPACITOR	0.18μF,50V
	or QFV11HJ-184	MMT CAPACITOR	0.18μF,50V
C411	QCBB1HJ-471	CAPACITOR	470PF,50V
C412	QFL31HJ-682	M CAPACITOR	0.0068μF,50V
	or QFN31HJ-682	M CAPACITOR	0.0068μF,50V
C414	QCBB1HJ-102	CAPACITOR	0.001μF,50V
C415	QEK61AM-226	E CAPACITOR	22μF,10V
C416	QEK61AM-226	E CAPACITOR	22μF,10V
C417	QCBB1HJ-271	CAPACITOR	270PF,50V
C418	QCBB1HJ-561	CAPACITOR	560PF,50V
C419	QCBB1HJ-102	CAPACITOR	0.001μF,50V
C420	QEK61HM-105	E CAPACITOR	1μF,50V
C421	QCBB1HJ-102	CAPACITOR	0.001μF,50V
C422	QFV71HJ-563	TF CAPACITOR	0.056μF,50V
	or QFV11HJ-563	MMT CAPACITOR	0.056μF,50V
C423	QCBB1HJ-102	CAPACITOR	0.001μF,50V
C427	QCBB1HJ-181	CAPACITOR	180PF,50V
C501	QCVB1CM-103	CAPACITOR	0.01μF,16V
C502	QCVB1CM-103	CAPACITOR	0.01μF,16V
C503	QCVB1CM-103	CAPACITOR	0.01μF,16V
C504	QFV71HJ-104	TF CAPACITOR	0.1μF,50V
	or QFV11HJ-104	MM CAPACITOR	0.1μF,50V
C505	QCVB1CM-103	CAPACITOR	0.01μF,16V
C506	QFV71HJ-683	TF CAPACITOR	0.068μF,50V
	or QFV11HJ-683	MMT CAPACITOR	0.068μF,50V
C507	QCVB1CM-103	CAPACITOR	0.01μF,16V
C508	QEK61AM-226	E CAPACITOR	22μF,10V
C509	QCVB1CM-103	CAPACITOR	0.01μF,16V
L501	PU59152-270J	COIL	27μH
CN401	PU59555-4	CAP HOUSING	
CN402	PU58844-3	CAP HOUSING	
CN501	PU59555-2	CAP HOUSING	
△ CP401	ICP-F15	CIRCUIT PROTECTOR	

- MECHACON SECTION -

IC601	M37419M8-121SP	IC	
	or M37419E8-230SP	IC	
IC602	CAT35C104P-006	IC, EG	
IC602	CAT35C104P-007	IC,E	
IC603	BA6251	IC	
IC604	M50253P	IC	
Q601	2SB1425(EU)	TRANSISTOR	

#△ REF No.	PART No.	PART NAME, DESCRIPTION	
Q602	DTC114ES	TRANSISTOR	
Q603	DTC144ES	TRANSISTOR	
Q604	DTC114ES	TRANSISTOR	
Q605	DTC114ES	TRANSISTOR	
D601	HZS7.5EB2	ZENER DIODE	
	or UZ7.5BSB	ZENER DIODE	
	or MTZ7.5B	ZENER DIODE	
D602	1SS133	DIODE	
	or MA165	DIODE	
D603	1SS133	DIODE	
	or MA165	DIODE	
D604	1SS133	DIODE	
	or MA165	DIODE	
D605	1SS133	DIODE	
	or MA165	DIODE	
D606	1SS133	DIODE	
	or MA165	DIODE	
D610	11ES2	DIODE	
	or S5688G	DIODE	
	or 1SR139-200	DIODE	
	or ERA15-02	DIODE	
R601	QRD161J-332	RESISTOR	3.3KΩ,1/6W
R602	QRD161J-332	RESISTOR	3.3KΩ,1/6W
R603	QRD161J-102	RESISTOR	1KΩ,1/6W
R604	QRD161J-472	RESISTOR	4.7KΩ,1/6W
R605	QRD161J-102	RESISTOR	1KΩ,1/6W
R606	QRD161J-472	RESISTOR	4.7KΩ,1/6W
R607	QRD161J-472	RESISTOR	4.7KΩ,1/6W
R608	QRD161J-472	RESISTOR	4.7KΩ,1/6W
R609	QRD161J-472	RESISTOR	4.7KΩ,1/6W
R610	QRD161J-472	RESISTOR	4.7KΩ,1/6W
R611	QRD161J-103	RESISTOR	10KΩ,1/6W
R612	QRD161J-472	RESISTOR	4.7KΩ,1/6W
R613	QRD161J-472	RESISTOR	4.7KΩ,1/6W
R614	QRD161J-472	RESISTOR	4.7KΩ,1/6W
R615	QRD161J-472	RESISTOR	4.7KΩ,1/6W
R616	QRD161J-472	RESISTOR	4.7KΩ,1/6W
R617	QRD161J-472	RESISTOR	4.7KΩ,1/6W
R618	QRD161J-472	RESISTOR	4.7KΩ,1/6W
R619	QRD161J-472	RESISTOR	4.7KΩ,1/6W
R620	QRD161J-105	RESISTOR	1MΩ,1/6W
R621	QRD161J-103	RESISTOR	10KΩ,1/6W
R622	QRD161J-472	RESISTOR	4.7KΩ,1/6W
R623	QRD161J-472	RESISTOR	4.7KΩ,1/6W
R624	QRD161J-102	RESISTOR	1KΩ,1/6W
R625	QRD161J-102	RESISTOR	1KΩ,1/6W
R626	QRD161J-102	RESISTOR	1KΩ,1/6W
R627	QRD161J-102	RESISTOR	1KΩ,1/6W
R628	QRD161J-822	RESISTOR	8.2KΩ,1/6W
R629	QRD161J-471	RESISTOR	470Ω,1/6W
R630	QRD161J-333	RESISTOR	33KΩ,1/6W
R631	QRD161J-103	RESISTOR	10KΩ,1/6W
R632	QRD161J-563	RESISTOR	56KΩ,1/6W
R633	QRD161J-333	RESISTOR	33KΩ,1/6W
R634	QRD161J-154	RESISTOR	150KΩ,1/6W
R635	QRD161J-224	RESISTOR	220KΩ,1/6W
R636	QRD161J-303	RESISTOR	30KΩ,1/6W
R637	QRD161J-152	RESISTOR	1.5KΩ,1/6W
R638	QRD161J-472	RESISTOR	4.7KΩ,1/6W
R639	QRD161J-103	RESISTOR	10KΩ,1/6W
R640	QRD161J-472	RESISTOR	4.7KΩ,1/6W
R641	QRD161J-391	RESISTOR	390Ω,1/6W
R643	QRD161J-472	RESISTOR	4.7KΩ,1/6W
R644	QRD161J-472	RESISTOR	4.7KΩ,1/6W
R645	QRD161J-681	RESISTOR	680Ω,1/6W
R646	QRD161J-103	RESISTOR	10KΩ,1/6W
R647	QRD161J-333	RESISTOR	33KΩ,1/6W
R648	QRD161J-151	RESISTOR	150Ω,1/6W
RA601	QRB045J-103XC	RESISTOR ARRAY	
RA602	QRB037J-333	NETWORK RESISTOR	33KΩ,3W
C601	QEK61HM-105	E CAPACITOR	1μF,50V
C602	QEK60JM-107	E CAPACITOR	100μF,6.3V
C603	QEK61EM-335	E CAPACITOR	3.3μF,25V
C604	QCFB1EZ-223	CAPACITOR	0.022μF,25V
C605	QCC11EK-104	CAPACITOR	0.1μF,25V
C606	QCBB1HJ-471	CAPACITOR	470PF,50V
C607	QCBB1HJ-121	CAPACITOR	120PF,50V
C608	QETB1CM-337	E CAPACITOR	330μF,16V
C609	QCSB1HK-6R8	CAPACITOR	6.8PF,50V
C611	QETC1HM-475	E CAPACITOR	4.7μF,50V
L601	PU59152-2R2J	COIL	2.2μH
△ CF601	PEVB0340	CERAMIC FILTER	
△ TH801	PU52108-1R0	POSITIVE THERMISTOR	
WR1	PW30602-17740	PARALLEL WIRE(CN601)	
CN601	PEMC0722-017	WIRE TRAP	
CN602	PU59555-4	CAP HOUSING	
CN603	PU60910-13	CAP HOUSING	
	or PU60727-13	CAP HOUSING	
CN604	PU59555-8	CAP HOUSING	
CN605	PU59555-8	CAP HOUSING	
CN606	PU59555-6	CAP HOUSING	

#△ REF No.	PART No.	PART NAME, DESCRIPTION	
△ CP601	ICP-F25	CIRCUIT PROTECTOR	
- REGULATOR SECTION -			
Q851	2SB810H,J	TRANSISTOR	
D851	1SS133	DIODE	
	or MA165	DIODE	
D852	1SS133	DIODE	
	or MA165	DIODE	
D853	1SS133	DIODE	
	or MA165	DIODE	
R851	QRD161J-393	RESISTOR	39KΩ,1/6W
R852	QRD161J-102	RESISTOR	1KΩ,1/6W
C853	QCBB1HJ-151	CAPACITOR	150PF,50V
L851	PU59152-100J	COIL	10μH
L853	PU59152-101J	COIL	100μH
CN801	PU61044-12	CAP HOUSING	
CN802	PU58844-3	CAP HOUSING	
- VPS BOARD ASSEMBLY -			
IC101	SDA5642	IC,EG	
R121	QRD161J-824	RESISTOR,EG	820KΩ,1/6W
R122	QRD161J-101	RESISTOR,EG	100Ω,1/6W
R123	QRD161J-562	RESISTOR,EG	5.6KΩ,1/6W
R124	QRD161J-104	RESISTOR,EG	100KΩ,1/6W
R127	QRD161J-105	RESISTOR,EG	1MΩ,1/6W
R128	QRD161J-824	RESISTOR,EG	820KΩ,1/6W
R129	QRD161J-202	RESISTOR,EG	2KΩ,1/6W
R134	QRD161J-271	RESISTOR,EG	270Ω,1/6W
R135	QRD161J-271	RESISTOR,EG	270Ω,1/6W
C108	QFN31HJ-104	M CAPACITOR,EG	0.1μF,50V
C109	QFN31HJ-333	M CAPACITOR,EG	0.033μF,50V
C110	QCVB1CN-103	CAPACITOR,EG	0.01μF,16V
C112	QCBB1HJ-151	CAPACITOR,EG	150PF,50V
CN101	PU59555-3	CAP HOUSING,E	
CN101	PU59555-5	CAP HOUSING,EG	

#△ REF No.	PART No.	PART NAME, DESCRIPTION	
CN151	PU58844-3	CAP HOUSING	
- ON SCREEN SECTION -			
IC901	M50552-148SP	IC	
IC951	M52684AP	IC	
IC952	BU4013B	IC	
	or TC4013BP	IC	
Q901	DTA114ES	TRANSISTOR	
Q902	DTA114ES	TRANSISTOR	
Q903	2SA933S(RS)	TRANSISTOR	
	or 2SA1267(YG)-TJK	TRANSISTOR	
Q951	DTC114ES	TRANSISTOR	
R901	QRD161J-471	RESISTOR	470Ω,1/6W
R902	QRD161J-103	RESISTOR	10KΩ,1/6W
R903	QRD161J-681	RESISTOR	680Ω,1/6W
R904	QRD161J-103	RESISTOR	10KΩ,1/6W
R905	QRD161J-102	RESISTOR	1KΩ,1/6W
R906	QRD161J-471	RESISTOR	470Ω,1/6W
R907	QRD161J-471	RESISTOR	470Ω,1/6W
R908	QRD161J-392	RESISTOR	3.9KΩ,1/6W
R909	QRD161J-752	RESISTOR	7.5KΩ,1/6W
R911	QRD161J-622	RESISTOR	6.2KΩ,1/6W
R912	QRD161J-242	RESISTOR	2.4KΩ,1/6W
R916	QRD161J-123	RESISTOR	12KΩ,1/6W
R917	QRD161J-123	RESISTOR	12KΩ,1/6W
R918	QRD161J-103	RESISTOR	10KΩ,1/6W
R919	QRD161J-102	RESISTOR	1KΩ,1/6W
R920	QRD161J-105	RESISTOR	1MΩ,1/6W
R924	QRD161J-472	RESISTOR	4.7KΩ,1/6W
R926	QRD161J-102	RESISTOR	1KΩ,1/6W
R928	QRD161J-471	RESISTOR	470Ω,1/6W
R951	QRD161J-103	RESISTOR	10KΩ,1/6W
R952	QRD161J-103	RESISTOR	10KΩ,1/6W
R953	QRD161J-271	RESISTOR	270Ω,1/6W
R954	QRD161J-152	RESISTOR	1.5KΩ,1/6W
R955	QRD161J-154	RESISTOR	150KΩ,1/6W
R956	QRD161J-473	RESISTOR	47KΩ,1/6W
C901	QETC0JM-476	E CAPACITOR	47μF,6.3V
C902	QCVB1CN-103	CAPACITOR	0.01μF,16V
C903	QETC1CM-106	E CAPACITOR	10μF,16V
C904	QCVB1CM-103	CAPACITOR	0.01μF,16V
C905	QAT3123-450	TRIM CAPACITOR, CHCTR POSITION	45PF
C906	QCSB1HJ-220	CAPACITOR	22PF,50V
C907	QCSB1HJ-330	CAPACITOR	33PF,50V
C908	QCSB1HJ-360	CAPACITOR	36PF,50V
C909	QCVB1CN-103	CAPACITOR	0.01μF,16V
C910	QCSB1HJ-270	CAPACITOR	27PF,50V

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
C911	QCVB1CN-103	CAPACITOR	0.01μF,16V
C912	QCSB1HJ-270	CAPACITOR	27PF,50V
C913	QCVB1CN-103	CAPACITOR	0.01μF,16V
C914	QEK61CM-106	E CAPACITOR	10μF,16V
C915	QCT25CH-150	CAPACITOR	15PF
C916	QAT3123-200	TRIMMER CAPACITOR, BG COLOUR	20PF
C917	QCT25CH-5R0	CAPACITOR	5PF
C921	QCBB1HJ-331	CAPACITOR	330PF,50V
C951	QFN31HJ-222	M CAPACITOR	0.0022μF,50V
C952	QCSB1HJ-220	CAPACITOR	22PF,50V
C953	QCXB1CN-152	CAPACITOR	0.0015μF,16V
C954	QCVB1CN-103	CAPACITOR	0.01μF,16V
C955	QER61HM-105	E CAPACITOR	1μF,50V
C956	QETC1CM-106	E CAPACITOR	10μF,16V
C957	QCVB1CN-103	CAPACITOR	0.01μF,16V
C958	QCVB1CN-103	CAPACITOR	0.01μF,16V
C959	QETC1HM-335	E CAPACITOR	3.3μF,50V
C960	QCVB1CN-103	CAPACITOR	0.01μF,16V
L901	PU54223-101K	COIL	100μH
L902	PU59152-220J	COIL	22μH
L903	PU59152-8R2J	COIL	8.2μH
L904	PU59152-150J	COIL	15μH
L905	PU59152-220J	COIL	22μH
L906	PU59152-220J	COIL	22μH
⚠ CF951	PU60086	RESONATOR	
⚠ X901	PU60908	CRYSTAL RESONATOR	
TP901	PU57545	TEST PIN	
TP902	PU57545	TEST PIN	
CN901	PU59555-7	CAP HOUSING	

- TERMINAL BOARD ASSEMBLY<06> -

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
PWBA	PB30080J-01	TERMINAL BOARD ASSEMBLY,E	
PWBA	PB30080H-01	TERMINAL BOARD ASSEMBLY,EG	
IC1	LA7222	IC	
IC2	BA15218	IC	
D1	1SS133	DIODE	
	or MA165	DIODE	
D2	1SS133	DIODE	
	or MA165	DIODE	
R1	QRD161J-471	RESISTOR	470Ω,1/6W
R2	QRD161J-471	RESISTOR	470Ω,1/6W
R3	QRD161J-103	RESISTOR	10KΩ,1/6W
R4	QRD161J-103	RESISTOR	10KΩ,1/6W
R5	QRD161J-273	RESISTOR	27KΩ,1/6W
R6	QRD161J-273	RESISTOR	27KΩ,1/6W
R7	QRD161J-563	RESISTOR	56KΩ,1/6W
R8	QRD161J-563	RESISTOR	56KΩ,1/6W
R9	QRD161J-563	RESISTOR	56KΩ,1/6W
R10	QRD161J-563	RESISTOR	56KΩ,1/6W
R11	QRD161J-471	RESISTOR	470Ω,1/6W
R12	QRD161J-471	RESISTOR	470Ω,1/6W
R13	QRD161J-223	RESISTOR	22KΩ,1/6W
C1	QEK61HM-475	E CAPACITOR	4.7μF,50V
C2	QEK61HM-475	E CAPACITOR	4.7μF,50V
C3	QER61CM-106	E CAPACITOR	10μF,16V
C4	QEK61CM-106	E CAPACITOR	10μF,16V
C6	QEP61EM-475	NP E CAPACITOR	4.7μF,25V
C7	QEP61EM-475	NP E CAPACITOR	4.7μF,25V
C8	QCBB1HJ-821	CAPACITOR,EG	820PF,50V
C9	QCBB1HJ-821	CAPACITOR,EG	820PF,50V
C10	QCBB1HJ-471	CAPACITOR,EG	470PF,50V
C11	QCBB1HJ-471	CAPACITOR,EG	470PF,50V
L1	PU59152-5R6J	COIL,EG	5.6μH
L2	PU59152-5R6J	COIL,EG	5.6μH
L3	PU59152-220J	COIL,EG	22μH
L4	PU59152-220J	COIL,EG	22μH
L5	PU59152-1R2K	COIL,EG	1.2μH
L6	PU59152-1R2K	COIL,EG	1.2μH
K1	PU60281-5	FERRITE BEADS,EG	
JP1	PU60770-111	PIN HEADER	
SCW1	SDSF2608Z	SCREW, X3	
TB1	PU60677	CONNECTOR BOARD ASSEMBLY	
CN1	PU59555-5	CAP HOUSING,EG	
CN1	PU59555-3	CAP HOUSING,E(1-3PIN)	
CN2	PU59555-4	CAP HOUSING,E	

- MIC MIX BOARD ASSEMBLY -

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	IC1	BA15218N	IC	
		or XRA15218N	IC	
	Q1	2SC1740S(RS)	TRANSISTOR	
		or 2SC3199(GB)-TJK	TRANSISTOR	
	Q2	2SD1468S(RS)	TRANSISTOR	
	D1	1SS133	DIODE	
		or MA165	DIODE	
	R2	QRD161J-202	RESISTOR	2KΩ,1/6W
	R3	QRD161J-104	RESISTOR	100KΩ,1/6W
	R4	QRD161J-221	RESISTOR	220Ω,1/6W
	R5	QRD161J-273	RESISTOR	27KΩ,1/6W
	R6	QRD161J-154	RESISTOR	150KΩ,1/6W
	R7	QRD161J-222	RESISTOR	2.2KΩ,1/6W
	R8	QRD161J-223	RESISTOR	22KΩ,1/6W
	R9	QRD161J-683	RESISTOR	68KΩ,1/6W
	R10	QRD161J-102	RESISTOR	1KΩ,1/6W
	R11	QRD161J-222	RESISTOR	2.2KΩ,1/6W
	R12	QRD161J-222	RESISTOR	2.2KΩ,1/6W
	R13	QRD161J-122	RESISTOR	1.2KΩ,1/6W
	R14	QRD161J-222	RESISTOR	2.2KΩ,1/6W
	R15	QRD161J-222	RESISTOR	2.2KΩ,1/6W
	R16	QRD161J-223	RESISTOR	22KΩ,1/6W
	R17	QRD161J-222	RESISTOR	2.2KΩ,1/6W
	R18	QRD161J-101	RESISTOR	100Ω,1/6W
	C1	QENC1CM-106	NP E CAPACITOR	10μF,16V
	C2	QENC1CM-106	NP E CAPACITOR	10μF,16V
	C3	QEK61HM-105	E CAPACITOR	1μF,50V
	C4	QEK61HM-105	E CAPACITOR	1μF,50V
	C5	QEK51HM-105	E CAPACITOR	1μF,50V
	C6	QEK61EM-475	E CAPACITOR	4.7μF,25V
	C7	QEK61EM-475	E CAPACITOR	4.7μF,25V
	C8	QEK51CM-476	E CAPACITOR	47μF,16V
	C9	QEK51CM-476	E CAPACITOR	47μF,16V
	C10	QETC1CM-476	E CAPACITOR	47μF,16V
	C11	QCBB1HJ-151	CAPACITOR	150PF,50V
	SLD1	PQ42581	PRE AMP SHIELD1	
	SLD2	PQ42583	PRE AMP SHIELD3	
	CN2	PU58844-5	CAP HOUSING	
	CN3	PU59555-4	CAP HOUSING	

- FLYING ERASE SECTION -

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	Q151	2SA933S(Q)	TRANSISTOR	
		or 2SA1267(Y)-TJK	TRANSISTOR	
	Q152	2SC1741S(QR)	TRANSISTOR	
	Q153	2SA933S(Q)	TRANSISTOR	
		or 2SA1267(Y)-TJK	TRANSISTOR	
	Q154	2SD639R	TRANSISTOR	
	Q155	2SD639R	TRANSISTOR	
	D151	UZ8.2BSC	ZENER DIODE	
	D152	1SS133	DIODE	
		or MA165	DIODE	
	R151	QRD161J-473	RESISTOR	47KΩ,1/6W
	R152	QRD161J-472	RESISTOR	4.7KΩ,1/6W
	R153	QRD161J-222	RESISTOR	2.2KΩ,1/6W
	R154	QRD161J-473	RESISTOR	47KΩ,1/6W
	R155	QRD161J-183	RESISTOR	18KΩ,1/6W
	R156	QRD161J-104	RESISTOR	100KΩ,1/6W
	R157	QRD161J-121	RESISTOR	120Ω,1/6W
	R158	QRD161J-104	RESISTOR	100KΩ,1/6W
	R159	QRD161J-121	RESISTOR	120Ω,1/6W
	R160	QRD161J-101	RESISTOR	100Ω,1/6W
	C151	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C152	QCC31EJ-123	CAPACITOR	0.012μF,25V
	C153	QCSB1HJ-560	CAPACITOR	56PF,50V
	C154	QCBB1HJ-820	CAPACITOR	82PF,50V
	C155	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C156	QCBB1HJ-820	CAPACITOR	82PF,50V
	C158	QCT25UJ-181	CAPACITOR	180PF
	C159	QCT05UJ-330	CAPACITOR	33PF
	L151	PU48530-560J	COIL	56μH
	L152	PU48530-3R3K	COIL	3.3μH
	L153	PU48530-3R3K	COIL	3.3μH
	L154	PU59152-101J	COIL	100μH
⚠	T151	PU56175	S.TRANS	
	SLD1	PU60779	SHIELD CASE	
	SLD2	PU60781	SHIELD COVER	
	SLD3	PU60780	SHIELD PLATE	

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VIDEO UNIT BOARD ASSEMBLY <05>

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	PWBA	PB10256E-01	VIDEO UNIT BOARD ASSY	
	IC1	PB20166G-01	Y MODULE BOARD ASSY	
⚠	IC2	MSM6967RS	IC	
	IC201	PB20227A	COLOR MODULE BOARD	
	IC251	BA7106LS	IC	
		or XRA7106LS	IC	
	Q1	DTA144EU	TRANSISTOR	
	Q2	2SC2412K	TRANSISTOR	
	Q3	DTC144EK	TRANSISTOR	
	Q4	2SA1037K	TRANSISTOR	
	Q5	2SC2412K	TRANSISTOR	
	Q201	2SC2412K	TRANSISTOR	
	Q202	2SC2412K	TRANSISTOR	
	Q203	DTC114WK	TRANSISTOR	
	Q204	2SC2412K	TRANSISTOR	
	Q205	2SA1037K	TRANSISTOR	
	Q251	DTC114WK	TRANSISTOR	
	D1	1SS133	DIODE	
		or MA165	DIODE	
	D2	1SS133	DIODE	
		or MA165	DIODE	
	D3	1SS133	DIODE	
		or MA165	DIODE	
	D4	1SS133	DIODE	
		or MA165	DIODE	
	D5	1SS292	DIODE	
	D6	1SS133	DIODE	
		or MA165	DIODE	
	D7	1SS133	DIODE	
		or MA165	DIODE	
	D9	RD9.1ES-T1B2	ZENER DIODE	
		or UZ9.1BSB	ZENER DIODE	
	D10	1SS133	DIODE	
		or MA165	DIODE	
	D201	1SS133	DIODE	
		or MA165	DIODE	
	D202	1SS133	DIODE	
		or MA165	DIODE	
	D203	1SS133	DIODE	
		or MA165	DIODE	
	D251	1SS133	DIODE	
		or MA165	DIODE	
	D252	1SS133	DIODE	
		or MA165	DIODE	
	D253	1SS133	DIODE	
		or MA165	DIODE	
	R1	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
	R2	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
	R3	QRSA08J-681YN	RESISTOR	680Ω,1/10W
	R5	QRSA08J-562YN	RESISTOR	5.6KΩ,1/10W
	R6	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
	R7	QRSA08J-104YN	RESISTOR	100KΩ,1/10W
	R8	QRSA08J-273YN	RESISTOR	27KΩ,1/10W
	R9	QRSA08J-394YN	RESISTOR	390KΩ,1/10W
	R10	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
	R11	QRSA08J-221YN	RESISTOR	220Ω,1/10W
	R12	QRSA08J-222YN	RESISTOR	2.2KΩ,1/10W
	R13	QRSA08J-221YN	RESISTOR	220Ω,1/10W
	R14	QRSA08J-222YN	RESISTOR	2.2KΩ,1/10W
	R15	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
	R16	QVZ3518-222AZ	V RESISTOR,NC BALANCE	2.2KΩ
		or QVZ3523-222AZ	V RESISTOR,NC BALANCE	2.2KΩ
	R17	QRSA08J-222YN	RESISTOR	2.2KΩ,1/10W
	R18	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
⚠	R20	QRD161J-181	RESISTOR	180Ω,1/6W
	R201	QRSA08J-183YN	RESISTOR	18KΩ,1/10W
	R202	QRSA08J-332YN	RESISTOR	3.3KΩ,1/10W
	R203	QRD161J-222	RESISTOR	2.2KΩ,1/6W
	R204	QRSA08J-333YN	RESISTOR	33KΩ,1/10W
	R205	QRD161J-223	RESISTOR	22KΩ,1/6W
	R206	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
	R207	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
	R208	QRSA08J-682YN	RESISTOR	6.8KΩ,1/10W
	R209	QRSA08J-391YN	RESISTOR	390Ω,1/10W
	R210	QRSA08J-333YN	RESISTOR	33KΩ,1/10W
	R211	QRSA08J-333YN	RESISTOR	33KΩ,1/10W
	R212	QRSA08J-152YN	RESISTOR	1.5KΩ,1/10W
	R213	QRSA08J-331YN	RESISTOR	330Ω,1/10W
	R214	QRSA08J-222YN	RESISTOR	2.2KΩ,1/10W
	R215	QRSA08J-332YN	RESISTOR	3.3KΩ,1/10W
	R216	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
	R217	QRSA08J-393YN	RESISTOR	39KΩ,1/10W
	R218	QRSA08J-332YN	RESISTOR	3.3KΩ,1/10W
	R219	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
	R220	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
	R221	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
	R222	QRSA08J-391YN	RESISTOR	390Ω,1/10W
	R223	QRSA08J-821YN	RESISTOR	820Ω,1/10W
	R224	QRSA08J-471YN	RESISTOR	470Ω,1/10W
	R251	QRSA08J-682YN	RESISTOR	6.8KΩ,1/10W
	R252	QRSA08J-333YN	RESISTOR	33KΩ,1/10W
	R253	QRD161J-273	RESISTOR	27KΩ,1/6W

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
R254	QRSA08J-914YN	RESISTOR	910KΩ,1/10W
R255	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R256	QRSA08J-104YN	RESISTOR	100KΩ,1/10W
C1	QCSA1HJ-220	CAPACITOR	22PF,50V
C2	QCFA1HZ-103	CAPACITOR	0.01μF,50V
C3	QCSA1HJ-151	CAPACITOR	150PF,50V
C4	QETC1AM-226	E CAPACITOR	22μF,10V
C5	QCYA1HK-102	CAPACITOR	0.001μF,50V
C6	QCFA1HZ-103	CAPACITOR	0.01μF,50V
C7	QETC1EM-335	E CAPACITOR	3.3μF,25V
C8	QEN60JM-336	NP E CAPACITOR	33μF,6.3V
C9	QETC1CM-106	E CAPACITOR	10μF,16V
C10	QCYA1HK-102	CAPACITOR	0.001μF,50V
C11	QCYA1HK-102	CAPACITOR	0.001μF,50V
C12	QEN61HM-224	NP E CAPACITOR	0.22μF,50V
	or QENC1HM-224	NP.E CAP	0.22μF,50V
C13	QCSA1HJ-120	CAPACITOR	12PF,50V
C14	QETC1EM-335	E CAPACITOR	3.3μF,25V
C15	QCVC1CN-103	CAPACITOR	0.01μF,16V
C16	QEN61HM-335	NP E CAPACITOR	3.3μF,50V
C17	QETC0JM-337	E CAPACITOR	330μF,6.3V
C18	QCFA1HZ-103	CAPACITOR	0.01μF,50V
C19	QEN61HM-225	NP E CAPACITOR	2.2μF,50V
C20	QCSA1HJ-120	CAPACITOR	12PF,50V
C21	QETC1EM-475	E CAPACITOR	4.7μF,25V
C22	QETC1EM-475	E CAPACITOR	4.7μF,25V
C23	QETC0JM-476	E CAPACITOR	47μF,6.3V
C24	QETC1HM-104	E CAPACITOR	0.1μF,50V
C25	QCFA1HZ-103	CAPACITOR	0.01μF,50V
C26	QCFA1HZ-103	CAPACITOR	0.01μF,50V
C27	QCFA1HZ-103	CAPACITOR	0.01μF,50V
C28	QCFA1HZ-103	CAPACITOR	0.01μF,50V
C29	QETC1AM-476	E CAPACITOR	47μF,10V
C201	QCSA1HJ-470	CAPACITOR	47PF,50V
C202	QCVB1CN-103	CAPACITOR	0.01μF,16V
C203	QCSA1HJ-820	CAPACITOR	82PF,50V
C204	QETC1HM-475	E CAPACITOR	4.7μF,50V
C205	QCVB1CN-103	CAPACITOR	0.01μF,16V
C206	QFN31HJ-224	M CAPACITOR	0.22μF,50V
C207	QFN31HJ-563	M CAPACITOR	0.056μF,50V
C208	QETC0JM-337	E CAPACITOR	330μF,6.3V
C209	QCC31CJ-223	CAPACITOR	0.022μF,16V
C210	QER60JM-107	E CAPACITOR	100μF,6.3V
C211	QER61CM-106	E CAPACITOR	10μF,16V
C212	QETC1HM-224	E CAPACITOR	0.22μF,50V
C213	QCFA1HZ-103	CAPACITOR	0.01μF,50V
C214	QCVB1CN-103	CAPACITOR	0.01μF,16V
C215	QETC1HM-474	E CAPACITOR	0.47μF,50V
C218	QCFA1HZ-103	CAPACITOR	0.01μF,50V
C219	QCC11CJ-473	CAPACITOR	0.047μF,16V
C220	QCBB1HJ-121	CAPACITOR	120PF,50V
C221	QCBB1HJ-102	CAPACITOR	0.001μF,50V
C222	QCSB1HJ-150	CAPACITOR	15PF,50V
C223	QCBB1HJ-102	CAPACITOR	0.001μF,50V

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
C251	QETC1CM-106	E CAPACITOR	10μF,16V
C252	QFN31HJ-471	M CAPACITOR	470PF,50V
C253	QCSA1HJ-270	CAPACITOR	27PF,50V
C254	QETC1HM-335	E CAPACITOR	3.3μF,50V
C255	QCYA1HK-472	CAPACITOR	0.0047μF,50V
C256	QCYA1HK-471	CAPACITOR	470PF,50V
C257	QCSA1HJ-5R0	CAPACITOR	5PF,50V
C258	QCFA1HZ-103	CAPACITOR	0.01μF,50V
C259	QCFA1HZ-103	CAPACITOR	0.01μF,50V
C260	QCFA1HZ-103	CAPACITOR	0.01μF,50V
C261	QCSA1HJ-220	CAPACITOR	22PF,50V
C262	QCFA1HZ-103	CAPACITOR	0.01μF,50V
C263	QETB0JM-477	E CAPACITOR	470μF,6.3V
C264	QCFA1HZ-103	CAPACITOR	0.01μF,50V
C265	QCFA1HZ-103	CAPACITOR	0.01μF,50V
L1	PU59152-121J	COIL	120μH
L2	PU59152-680J	COIL	68μH
L3	PU48530-101K	COIL	100μH
L4	PU59152-R22J	COIL	0.22μH
L5	PU59152-101J	COIL	100μH
L6	PU59152-R22J	COIL	0.22μH
L201	PU48530-271J	COIL	270μH
L202	PU59153-822J	COIL	8.2mH
⚠ L203	PU48530-151J	COIL	150μH
L205	PU59152-150J	COIL	15μH
L251	PU59152-330J	COIL	33μH
L252	PU48530-101K	COIL	100μH
EQ2	PU60162-2	EQUALIZER	
	or PU60162	EQUALIZER	
EQ201	PU53501-13	EQUALIZER	
LPF1	PU58021-3	LOW PASS FILTER	
	or PU60715	LOW PASS FILTER	
	or PU58021-2	LOW PASS FILTER	
LPF2	PU60716	LOW PASS FILTER	
LPF201	PU58022	LOW PASS FILTER	
BPF201	PU60654	BAND PASS FILTER	
	or PU60654-2	BAND PASS FILTER	
BPF202	PU60713	BAND PASS FILTER	
CF201	PU57073	CERAMIC FILTER	

⚠ REF No.	PART No.	PART NAME, DESCRIPTION
DL201	PU60340-2	COMB FILTER
	or PU60490	COMB FILTER
	or PU58971-3	COMB FILTER
LC251	PU60655	COIL,SECAM DET
⚠ X201	PU60653	CRYSTAL UNITS
SLD1	PQ42994	SHIELD PLATE
SLD2	PQ42995	SHIELD CASE
SLD3	PQ42996	SHIELD COVER
TP21	PU56347	TEST POINT
CN1	PU60330-113	CONNECTOR
CN2	PU60330-113	CONNECTOR
CN3	PU60330-110	CONNECTOR,(TERMINAL)

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IF BOARD ASSEMBLY <07>

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
PWBA	PB10367P	IF BOARD ASSEMBLY	
IC1	M51365SP	IC	
Q1	2SA1532(C)	TRANSISTOR	
Q2	2SC3354	TRANSISTOR	
Q3	2SC1317(RS)	TRANSISTOR	
Q4	2SA933S(S)	TRANSISTOR	
Q5	2SD1819A(RS)	TRANSISTOR	
Q6	FMS2	TRANSISTOR	
Q7	2SC1740(RS)	TRANSISTOR	
	or 2SC536SPA(FG)	TRANSISTOR	
	or 2SC3311A(RS)	TRANSISTOR	
Q8	2SA1532(C)	TRANSISTOR	
Q10	2SC3354	TRANSISTOR	
Q11	2SC1740(RS)	TRANSISTOR	
	or 2SC536SPA(FG)	TRANSISTOR	
	or 2SC3311A(RS)	TRANSISTOR	
Q12	DTC144EU	TRANSISTOR	
Q13	DTC144ES	TRANSISTOR	
	or UN4213	TRANSISTOR	
	or 2SC3399	TRANSISTOR	
Q15	2SK381(C)	FE TRANSISTOR	
D1	MTZ10D	ZENER DIODE	
D6	DA204U	DIODE	
R1	NRD718J-750NBU	RESISTOR	75Ω,1/8W
R4	NRD718J-392NBU	RESISTOR	3.9KΩ,1/8W
R5	NRD718J-151NBU	RESISTOR	150Ω,1/8W
R6	NRD718J-272NBU	RESISTOR	2.7KΩ,1/8W
R7	NRD718J-222NBU	RESISTOR	2.2KΩ,1/8W
R8	NRD718J-681NBU	RESISTOR	680Ω,1/8W
R10	NRD718J-471NBU	RESISTOR	470Ω,1/8W
R11	NRD718J-101NBU	RESISTOR	100Ω,1/8W
R14	NRD718J-101NBU	RESISTOR	100Ω,1/8W
R15	NRD718J-271NBU	RESISTOR	270Ω,1/8W
R17	NRD718J-562NBU	RESISTOR	5.6KΩ,1/8W
R18	NRD718J-332NBU	RESISTOR	3.3KΩ,1/8W
R19	NRD718J-222NBU	RESISTOR	2.2KΩ,1/8W
R20	NRD718J-222NBU	RESISTOR	2.2KΩ,1/8W
R21	QVZ3518-472	V RESISTOR,RF AGC	4.7KΩ
	or QVZ3523-472	V RESISTOR,RF AGC	4.7KΩ
R22	NRD718J-824NBU	RESISTOR	820KΩ,1/8W
R24	NRD718J-821NBU	RESISTOR	820Ω,1/8W
R31	NRD718J-222NBU	RESISTOR	2.2KΩ,1/8W
R32	NRD718J-102NBU	RESISTOR	1KΩ,1/8W
R33	NRD718J-223NBU	RESISTOR	22KΩ,1/8W
R34	NRD718J-470NBU	RESISTOR	47Ω,1/8W
R35	NRD718J-561NBU	RESISTOR	560Ω,1/8W
R36	NRD718J-561NBU	RESISTOR	560Ω,1/8W
R37	NRD718J-101NBU	RESISTOR	100Ω,1/8W
R38	NRD718J-182NBU	RESISTOR	1.8KΩ,1/8W
R39	NRD718J-272NBU	RESISTOR	2.7KΩ,1/8W
R40	QVZ3518-103	V RESISTOR, COLOUR LEVEL	10KΩ
	or QVZ3523-103	V RESISTOR, COLOUR LEVEL	10KΩ
R45	NRD718J-471NBU	RESISTOR	470Ω,1/8W
R46	NRD718J-104NBU	RESISTOR	100KΩ,1/8W
R47	NRD718J-153NBU	RESISTOR	15KΩ,1/8W
R48	NRD718J-392NBU	RESISTOR	3.9KΩ,1/8W
R49	NRD718J-103NBU	RESISTOR	10KΩ,1/8W
R50	NRD718J-471NBU	RESISTOR	470Ω,1/8W
R51	NRD718J-223NBU	RESISTOR	22KΩ,1/8W
R52	NRD718J-223NBU	RESISTOR	22KΩ,1/8W
R53	NRD718J-103NBU	RESISTOR	10KΩ,1/8W
R54	NRD718J-822NBU	RESISTOR	8.2KΩ,1/8W
R57	NRD718J-153NBU	RESISTOR	15KΩ,1/8W
R62	NRD718J-392NBU	RESISTOR	3.9KΩ,1/8W
R64	NRD718J-182NBU	RESISTOR	1.8KΩ,1/8W
R65	NRD718J-221NBU	RESISTOR	220Ω,1/8W
R66	NRD718J-222NBU	RESISTOR	2.2KΩ,1/8W

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
R71	NRD718J-681NBU	RESISTOR	680Ω,1/8W
R72	NRD718J-330NBU	RESISTOR	33Ω,1/8W
R73	NRD718J-331NBU	RESISTOR	330Ω,1/8W
R82	NRD718J-680NBU	RESISTOR	68Ω,1/8W
R83	NRD718J-331NBU	RESISTOR	330Ω,1/8W
R84	NRD718J-393NBU	RESISTOR	39KΩ,1/8W
R85	NRD718J-752NBU	RESISTOR	7.5KΩ,1/8W
R86	NRD718J-222NBU	RESISTOR	2.2KΩ,1/8W
R100	NRD718J-105NBU	RESISTOR	1MΩ,1/8W
R101	NRD718J-222NBU	RESISTOR	2.2KΩ,1/8W
R102	NRD718J-222NBU	RESISTOR	2.2KΩ,1/8W
R110	QRD162J-683	RESISTOR	68KΩ,1/6W
C2	NCT02CH-3R9NBR	CAPACITOR	3.9PF,160V
C3	QCT25HH-101	CAPACITOR	100PF
C4	NCT02CH-4R7NBR	CAPACITOR	4.7PF,160V
C5	NCB71HK-102NBR	CAPACITOR	0.001μF,50V
C6	NCX71CM-222NBR	CAPACITOR	0.0022μF,16V
C7	NCB71HK-102NBR	CAPACITOR	0.001μF,50V
C8	NCB71HK-102NBR	CAPACITOR	0.001μF,50V
C10	QETC1CM-107	E CAPACITOR	100μF,16V
C11	NCY71CM-103NBR	CAPACITOR	0.01μF,16V
C13	NCX71CM-222NBR	CAPACITOR	0.0022μF,16V
C14	PU57601-474ME	E CAPACITOR	0.47μF
C15	QETC1CM-336	E CAPACITOR	33μF,16V
C16	NCX71CM-222NBR	CAPACITOR	0.0022μF,16V
C17	NCF71EZ-223NBR	CAPACITOR	0.022μF,25V
C19	NCY71CM-103NBR	CAPACITOR	0.01μF,16V
C20	NCY71CM-103NBR	CAPACITOR	0.01μF,16V
C21	NCB71HK-101NBR	CAPACITOR	100PF,50V
C24	QETC1HM-105	E CAPACITOR	1μF,50V
C25	NCX71CM-222NBR	CAPACITOR	0.0022μF,16V
C26	QFN31HK-222	M CAPACITOR	0.0022μF,50V
C27	QETC1HM-474	E CAPACITOR	0.47μF,50V
C29	NCS71HJ-470NBR	CAPACITOR	47PF,50V
C31	QETC1HM-335	E CAPACITOR	3.3μF,50V
C32	NCF71EZ-223NBR	CAPACITOR	0.022μF,25V
C33	QETC1HM-474	E CAPACITOR	0.47μF,50V
C41	NCB71HK-102NBR	CAPACITOR	0.001μF,50V
C43	NCX71CM-222NBR	CAPACITOR	0.0022μF,16V
C44	NCB71HK-102NBR	CAPACITOR	0.001μF,50V
C45	NCB71HK-102NBR	CAPACITOR	0.001μF,50V
C46	NCB71HK-102NBR	CAPACITOR	0.001μF,50V
C50	QETC1CM-336	E CAPACITOR	33μF,16V
C56	QETC1CM-336	E CAPACITOR	33μF,16V
C58	NCS71HJ-100NBR	CAPACITOR	10PF,50V
C63	NCB71HK-102NBR	CAPACITOR	0.001μF,50V
C64	NCB71HK-391NBR	CAPACITOR	390PF,50V

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
L1	PU60025-R68	COIL	0.68μH
L2	PU60025-R82	COIL	0.82μH
L3	PU60025-1R5	COIL	1.5μH
L4	PU59152-8R2J	COIL	8.2μH
L5	PU59152-220J	COIL	22μH
L6	PU59152-6R8K	COIL	6.8μH
	or PU59152-6R8J	COIL	6.8μH
L7	PU59152-R22K	COIL	0.22μH
L9	PU59152-6R8K	COIL	6.8μH
CF1	PU49295-2	N FILTER	
CF3	PU32990-2	CERAMIC FILTER	
CF4	PU49295	CERAMIC FILTER	
CF5	PU32990-4	CERAMIC FILTER	
SAW1	PU35557-7	SAW FILTER	
SAW2	PU60765	SAW FILTER	
T1	PU60042-2	COIL	
T2	PU60497	IF. TRANSFORMER, VOC	
T4	PU59488	COIL	
T5	PU60046	IF. TRANSFORMER, SYNC DET	
T8	PU60259	COIL	
JP1	PU59935-16	TERMINAL	

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TUNER CONTROL BOARD ASSEMBLY <08>

PWBA	PB20326N	TUNER CONTROL BOARD ASSY,EG
PWBA	PB20326P	TUNER CONTROL BOARD ASSY,E
⚠ TNR1	PERF0023	UHF/VHF TUNER,EG
⚠ TNR1	PERF0024	UHF/VHF TUNER,E
Q2	2SD1863(QR)	TRANSISTOR
	or 2SC3243D,E	TRANSISTOR
Q3	2SB810H,J	TRANSISTOR
Q4	DTC144ES	TRANSISTOR
	or UN4213	TRANSISTOR
	or 2SC3399	TRANSISTOR
Q6	2SC3313CTA	TRANSISTOR
D1	HZT33-02	ZENER DIODE
D2	E-452-2	DIODE

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
D3	RD5.6ES-T1B3	ZENER DIODE	
	or MTZ5.6CT-77	ZENER DIODE	
D4	1SS133	DIODE	
D5	1SS133	DIODE	
R2	QRD161J-104	RESISTOR	100KΩ,1/6W
R3	QRD161J-153	RESISTOR	15KΩ,1/6W
R7	QRD161J-271	RESISTOR	270Ω,1/6W
R8	QRD161J-153	RESISTOR	15KΩ,1/6W
R9	QRD161J-182	RESISTOR	1.8KΩ,1/6W
R30	QRD161J-331	RESISTOR	330Ω,1/6W
R32	QRD161J-103	RESISTOR	10KΩ,1/6W
R36	QRD161J-560	RESISTOR	56Ω,1/6W
C1	QETC1CM-337	E CAPACITOR	330μF,16V
C2	QETC1HM-225	E CAPACITOR	2.2μF,50V
C4	QCBB1HK-102	CAPACITOR	0.001μF,50V
C5	QCBB1HK-102	CAPACITOR	0.001μF,50V
C6	QCBB1HJ-471	CAPACITOR	470PF,50V
C7	QCBB1HJ-102	CAPACITOR	0.001μF,50V
C14	QETC1CM-336	E CAPACITOR	33μF,16V
C15	QETC1CM-107	E CAPACITOR	100μF,16V
C16	QETC1CM-106	E CAPACITOR	10μF,16V
C23	QETC1HM-106	E CAPACITOR	10μF,50V
C26	QCBB1HJ-471	CAPACITOR	470PF,50V
C28	QETC1HM-474	E CAPACITOR	0.47μF,50V
C29	QCBB1HJ-910	CAPACITOR	91PF,50V
L1	PU59152-R22K	COIL	0.22μH
L2	PU59152-6R8K	COIL	6.8μH
L4	PU59152-1R0K	COIL	1μH
L5	PU59152-100J	COIL	10μH
L7	PU59152-2R7K	COIL	2.7μH
L9	PU59152-5R6J	COIL	5.6μH
L10	PU59152-1R0K	COIL	1μH
HD1	PU36416-1-3	HOLDER	
CN1	PU58844-6	CAP HOUSING	
CN2	PU59555-8	CAP HOUSING	
CN3	PU58844-6	CAP HOUSING	
⚠ CP1	ICP-F10	CIRCUIT PROTECTOR	

#⚠ REF No. PART No. PART NAME, DESCRIPTION

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AUDIO BOARD ASSEMBLY <09>

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION
PWBA	PB20390P-01	AUDIO BOARD ASSEMBLY,E
PWBA	PB20390N-01	AUDIO BOARD ASSEMBLY,EG
IC1	AN3380NK	IC
IC2	TA7361AP	IC
IC3	PB20167A-02	FMA MODULE BOARD ASSY
Q1	2SC1740S(RS)	TRANSISTOR
	or 2SC3199(GB)-TJK	TRANSISTOR
Q2	2SC1740S(Q)	TRANSISTOR
Q3	DTC114ES	TRANSISTOR
Q4	2SC1740S(RS)	TRANSISTOR
	or 2SC3199(GB)-TJK	TRANSISTOR
Q5	DTC114ES	TRANSISTOR
Q6	DTC114ES	TRANSISTOR
Q7	DTC114ES	TRANSISTOR
Q8	DTA114ES	TRANSISTOR
Q9	DTA114ES	TRANSISTOR
Q12	DTC143TS	TRANSISTOR
Q13	DTC143TS	TRANSISTOR
Q16	2SC1740S(Q)	TRANSISTOR
Q17	DTA114ES	TRANSISTOR
Q22	2SC1740S(RS)	TRANSISTOR
	or 2SC3199(GB)-TJK	TRANSISTOR
Q23	2SC1740S(RS)	TRANSISTOR
	or 2SC3199(GB)-TJK	TRANSISTOR
Q101	2SD1468S(RS)	TRANSISTOR
Q102	2SA854S(QR)	TRANSISTOR
D1	1SS133	DIODE
	or MA165	DIODE
D2	1SS133	DIODE
	or MA165	DIODE
D3	1SS133	DIODE
	or MA165	DIODE
D4	1SS133	DIODE
	or MA165	DIODE
D7	1SS133	DIODE
	or MA165	DIODE
D9	HZ2BLL	ZENER DIODE
D12	1SS133	DIODE
	or MA165	DIODE
D21	1SS133	DIODE
	or MA165	DIODE
D22	1SS133	DIODE

#△ REF No.	PART No.	PART NAME, DESCRIPTION	
	or MA165	DIODE	
R1	QRD162J-221	RESISTOR	220Ω,1/6W
R3	QRD161J-102	RESISTOR	1KΩ,1/6W
R4	QRD161J-682	RESISTOR	6.8KΩ,1/6W
R5	QRD161J-271	RESISTOR	270Ω,1/6W
R6	QRD161J-331	RESISTOR	330Ω,1/6W
R7	QRD161J-182	RESISTOR	1.8KΩ,1/6W
R8	QRD161J-100	RESISTOR	10Ω,1/6W
R9	QVZ3523-683AZ	V RESISTOR,BIAS ADJ	68KΩ
	or QVZ3518-683AZ	V RESISTOR, BIAS ADJ	68KΩ
R10	QRD161J-333	RESISTOR	33KΩ,1/6W
R11	QRD161J-473	RESISTOR	47KΩ,1/6W
R12	QRD161J-101	RESISTOR	100Ω,1/6W
R13	QRD161J-473	RESISTOR	47KΩ,1/6W
R14	QRD161J-6R8	RESISTOR	6.8Ω,1/6W
R15	QRD161J-103	RESISTOR	10KΩ,1/6W
R18	QRD161J-153	RESISTOR	15KΩ,1/6W
R20	QRD161J-223	RESISTOR	22KΩ,1/6W
R21	QRD161J-271	RESISTOR	270Ω,1/6W
R22	QRD161J-151	RESISTOR	150Ω,1/6W
R23	QRD161J-303	RESISTOR	30KΩ,1/6W
R25	QRD161J-103	RESISTOR	10KΩ,1/6W
R26	QRD161J-334	RESISTOR	330KΩ,1/6W
R27	QRD161J-561	RESISTOR	560Ω,1/6W
R29	QRD161J-102	RESISTOR	1KΩ,1/6W
R31	QRD161J-151	RESISTOR	150Ω,1/6W
R32	QRD161J-102	RESISTOR	1KΩ,1/6W
R33	QRD161J-102	RESISTOR	1KΩ,1/6W
R34	QRD161J-151	RESISTOR	150Ω,1/6W
R36	QRD161J-392	RESISTOR	3.9KΩ,1/6W
R37	QRD161J-152	RESISTOR	1.5KΩ,1/6W
R38	QRD161J-181	RESISTOR	180Ω,1/6W
R39	QRD161J-183	RESISTOR	18KΩ,1/6W
R40	QVZ3523-473AZ	V RESISTOR, EE LEVEL (L)	47KΩ
	or QVZ3518-473AZ	V RESISTOR, EE LEVEL (L)	47KΩ
R41	QVZ3523-473AZ	V RESISTOR, EE LEVEL (R)	47KΩ
	or QVZ3518-473AZ	V RESISTOR, EE LEVEL (R)	47KΩ
R42	QRD161J-243	RESISTOR	24KΩ,1/6W
R43	QRD161J-101	RESISTOR	100Ω,1/6W
R44	QRD161J-101	RESISTOR	100Ω,1/6W
R45	QRD161J-392	RESISTOR	3.9KΩ,1/6W
R46	QRD161J-332	RESISTOR	3.3KΩ,1/6W
R47	QRD161J-153	RESISTOR	15KΩ,1/6W
R48	QRD161J-223	RESISTOR	22KΩ,1/6W
R49	QRD161J-274	RESISTOR	270KΩ,1/6W
R50	QRD161J-222	RESISTOR	2.2KΩ,1/6W
R51	QRD162J-222	RESISTOR	2.2KΩ,1/6W
R52	QRD161J-103	RESISTOR	10KΩ,1/6W
R53	QRD161J-333	RESISTOR	33KΩ,1/6W
R54	QRD161J-223	RESISTOR	22KΩ,1/6W
R55	QRD161J-363	RESISTOR	36KΩ,1/6W
R58	QRD161J-333	RESISTOR	33KΩ,1/6W
R59	QRD161J-333	RESISTOR	33KΩ,1/6W
R60	QRD161J-333	RESISTOR	33KΩ,1/6W

#△ REF No.	PART No.	PART NAME, DESCRIPTION	
R61	QRD161J-272	RESISTOR	2.7KΩ,1/6W
R62	QRD161J-333	RESISTOR	33KΩ,1/6W
R63	QRD161J-102	RESISTOR	1KΩ,1/6W
R64	QRD161J-331	RESISTOR	330Ω,1/6W
R65	QRD161J-393	RESISTOR	39KΩ,1/6W
R66	QRD161J-8R2	RESISTOR	8.2Ω,1/6W
R67	QRD161J-103	RESISTOR	10KΩ,1/6W
R68	QRD161J-472	RESISTOR	4.7KΩ,1/6W
R70	QRD161J-273	RESISTOR	27KΩ,1/6W
R71	QRD161J-560	RESISTOR	56Ω,1/6W
R72	QRD161J-392	RESISTOR	3.9KΩ,1/6W
R73	QVZ3523-332AZ	V RESISTOR, LEVEL IND (L)	3.3KΩ
	or QVZ3518-332AZ	V RESISTOR, LEVEL IND (L)	3.3KΩ
R74	QVZ3523-332AZ	V RESISTOR, LEVEL IND (R)	3.3KΩ
	or QVZ3518-332AZ	V RESISTOR, LEVEL IND (R)	3.3KΩ
R75	QRD161J-560	RESISTOR	56Ω,1/6W
R78	QRD161J-471	RESISTOR	470Ω,1/6W
R80	QRD161J-562	RESISTOR	5.6KΩ,1/6W
R81	QRD161J-103	RESISTOR	10KΩ,1/6W
R82	QRD161J-153	RESISTOR	15KΩ,1/6W
R83	QRD161J-473	RESISTOR	47KΩ,1/6W
R84	QRD161J-473	RESISTOR	47KΩ,1/6W
R87	QRD161J-102	RESISTOR	1KΩ,1/6W
R88	QRD161J-102	RESISTOR	1KΩ,1/6W
R98	QRD161J-681	RESISTOR	680Ω,1/6W
R101	QRD161J-471	RESISTOR	470Ω,1/6W
R103	QRD161J-103	RESISTOR	10KΩ,1/6W
R104	QRD161J-222	RESISTOR	2.2KΩ,1/6W
C1	QETC1CM-106	E CAPACITOR	10μF,16V
C2	QETC1AM-476	E CAPACITOR	47μF,10V
C3	QENC1CM-106	NP E CAPACITOR	10μF,16V
C4	QETC1CM-106	E CAPACITOR	10μF,16V
C5	QETC1CM-226	E CAPACITOR	22μF,16V
C6	QETC1AM-336	E CAPACITOR	33μF,10V
C7	QETC1AM-476	E CAPACITOR	47μF,10V
C8	QCBB1HJ-102	CAPACITOR	0.001μF,50V
C9	QCBB1HJ-101	CAPACITOR	100PF,50V
C10	QETC1AM-336	E CAPACITOR	33μF,10V
C11	QETC1AM-107	E CAPACITOR	100μF,10V
C12	QETC1CM-226	E CAPACITOR	22μF,16V
C13	QETC1CM-106	E CAPACITOR	10μF,16V
C14	QENC1CM-106	NP E CAPACITOR	10μF,16V
C15	QETC1AM-476	E CAPACITOR	47μF,10V
C16	QETC1CM-106	E CAPACITOR	10μF,16V
C17	QCBB1HJ-331	CAPACITOR	330PF,50V
C18	QFV71HJ-223	TF CAPACITOR	0.022μF,50V
C19	QFL31HJ-102	M CAPACITOR	0.001μF,50V
C20	QFL31HJ-102	M CAPACITOR	0.001μF,50V
C21	QETC1EM-475	E CAPACITOR	4.7μF,25V
C22	QETC1HM-334	E CAPACITOR	0.33μF,50V
C23	QCBB1HJ-331	CAPACITOR	330PF,50V
C24	QCBB1HJ-102	CAPACITOR	0.001μF,50V
C25	QETC1HM-225	E CAPACITOR	2.2μF,50V
C26	QETC1AM-336	E CAPACITOR	33μF,10V

△ REF No.	PART No.	PART NAME, DESCRIPTION	
C27	QETC0JM-476	E CAPACITOR	47μF,6.3V
C28	QFV71HJ-563	TF CAPACITOR	0.056μF,50V
C29	QFV71HJ-273	TF CAPACITOR	0.027μF,50V
C30	QETC1CM-106	E CAPACITOR	10μF,16V
C32	QFV71HJ-103	TF CAPACITOR	0.01μF,50V
C33	QETC1HM-334	E CAPACITOR	0.33μF,50V
C34	QEB51CM-685	E CAPACITOR	6.8μF,16V
C35	QEB51HM-105	E CAPACITOR	1μF,50V
C36	QETC1CM-106	E CAPACITOR	10μF,16V
C37	QETC1AM-336	E CAPACITOR	33μF,10V
C38	QETC1CM-476	E CAPACITOR	47μF,16V
C39	QETC1AM-336	E CAPACITOR	33μF,10V
C40	QETC1CM-106	E CAPACITOR	10μF,16V
C41	QETC1CM-476	E CAPACITOR	47μF,16V
C42	QETC1CM-106	E CAPACITOR	10μF,16V
C43	QETC1CM-106	E CAPACITOR	10μF,16V
C44	QETC1CM-106	E CAPACITOR	10μF,16V
C45	QENC1CM-106	NP E CAPACITOR	10μF,16V
C46	QENC1CM-106	NP E CAPACITOR	10μF,16V
C47	QETC1HM-225	E CAPACITOR	2.2μF,50V
C48	QETC1HM-104	E CAPACITOR	0.1μF,50V
C49	QCS31HJ-391	CAPACITOR	390PF,50V
C50	QFN31HJ-102	M CAPACITOR	0.001μF,50V
C51	QFN31HJ-102	M CAPACITOR	0.001μF,50V
C52	QFV71HJ-224	TF CAPACITOR	0.22μF,50V
C53	QCS31HJ-391	CAPACITOR	390PF,50V
C54	QEK60JM-107	E CAPACITOR	100μF,6.3V
C55	QCVB1CM-103	CAPACITOR	0.01μF,16V
C56	QFV71HJ-224	TF CAPACITOR	0.22μF,50V
C57	QCSB1HJ-330	CAPACITOR	33PF,50V
C58	QCBB1HJ-331	CAPACITOR	330PF,50V
C59	QCBB1HJ-102	CAPACITOR	0.001μF,50V
C60	QCVB1CM-103	CAPACITOR	0.01μF,16V
C61	QCBB1HJ-151	CAPACITOR	150PF,50V
C62	QCBB1HJ-821	CAPACITOR	820PF,50V
C63	QFL31HJ-222	M CAPACITOR	0.0022μF,50V
C64	QCVB1CN-103	CAPACITOR	0.01μF,16V
C66	QCVB1CN-103	CAPACITOR	0.01μF,16V
C67	QETC1CM-106	E CAPACITOR	10μF,16V
C68	QEK61HM-225	E CAPACITOR	2.2μF,50V
C69	QEK61HM-225	E CAPACITOR	2.2μF,50V
C70	QETC1CM-106	E CAPACITOR	10μF,16V
C72	QCBB1HJ-561	CAPACITOR	560PF,50V
C73	QCBB1HJ-561	CAPACITOR	560PF,50V
C74	QFL31HJ-102	M CAPACITOR	0.001μF,50V
C75	QFL31HJ-102	M CAPACITOR	0.001μF,50V
C76	QFV71HJ-333	TF CAPACITOR	0.033μF,50V
C77	PU57601-106MC	E CAPACITOR	10μF
	or PU57601-106ME	E CAPACITOR	10μF
	or PU57601-475ME	E CAPACITOR	4.7μF
	or PU57601-106MC	E CAPACITOR	10μF
	or PU57601-475MC	E CAPACITOR	4.7μF
C79	QFV71HJ-273	TF CAPACITOR	0.027μF,50V
C80	QCBB1HJ-102	CAPACITOR	0.001μF,50V
C82	QCBB1HJ-102	CAPACITOR	0.001μF,50V

#△ REF No.	PART No.	PART NAME, DESCRIPTION	
C101	QETB1CM-227	E CAPACITOR	220μF,16V
C103	QEK61CM-476	E CAPACITOR	47μF,16V
L1	PU48530-181J	COIL	180μH
L3	PU58308-682J	COIL	6.8mH
L4	PU54223-221J	COIL	220μH
L5	PU48530-101J	COIL	100μH
BPF1	PU60610	BPF(1.4MHZ)	
BPF2	PU60611	BPF(1.8MHZ)	
HG1	PU58018-1-2	PWB HINGE,X2	
△ T1	PU60303	OSC TRANSFORMER	
△ T2	PU60304	OSC TRANSFORMER	
SLD1	PU59960	P/R AMP SHIELD1	
SLD2	PU59961	P/R AMP SHIELD2	
SLD3	PU59962	P/R AMP SHIELD3	
TP1	PU55774	TEST PIN,X6	
CN1	PU58844-3	CAP HOUSING	
CN2	PU59555-8	CAP HOUSING	
CN3	PU59555-6	CAP HOUSING	
CN5	PU58844-4	CAP HOUSING	
CN6	PU58844-2	CAP HOUSING	
CN7	PU58844-4	CAP HOUSING	
CN8	PU59555-4	CAP HOUSING	
CN9	PU59555-4	CAP HOUSING,E	
CN9	PU58844-4	CAP HOUSING,EG	
CN10	PU59555-5	CAP HOUSING	
CN11	PU58844-3	CAP HOUSING	
CN12	PU59555-6	CAP HOUSING	
CN13	PU59555-4	CAP HOUSING	
CN15	PU59555-2	CAP HOUSING	
△ CP1	ICP-F10	CIRCUIT PROTECTOR	

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AUDIO CONTROL HEAD BOARD <12>

PWB1	PB40068	AUDIO CONTROL HEAD BOARD
CN1	PU58844-107	CAP HOUSING

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DEMODULATOR BOARD ASSEMBLY <14>

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	PWBA	PB20240F	DEMOD BOARD ASSEMBLY	
	IC1	TDA3800GS	IC	
	Q1	DTC114ES	TRANSISTOR	
		or 2SC3402	TRANSISTOR	
		or UN4211	TRANSISTOR	
	Q2	2SD1292(QR)	TRANSISTOR	
		or 2SC3068	TRANSISTOR	
	Q3	DTC114ES	TRANSISTOR	
		or UN4211	TRANSISTOR	
		or 2SC3402	TRANSISTOR	
	Q4	DTC114ES	TRANSISTOR	
		or UN4211	TRANSISTOR	
		or 2SC3402	TRANSISTOR	
	Q5	DTC114ES	TRANSISTOR	
		or UN4211	TRANSISTOR	
		or 2SC3402	TRANSISTOR	
	Q6	DTC114ES	TRANSISTOR	
		or UN4211	TRANSISTOR	
		or 2SC3402	TRANSISTOR	
	Q7	DTC114ES	TRANSISTOR	
		or UN4211	TRANSISTOR	
		or 2SC3402	TRANSISTOR	
	Q8	DTC114ES	TRANSISTOR	
		or 2SC3402	TRANSISTOR	
		or UN4211	TRANSISTOR	
	Q9	2SD1450S,T	TRANSISTOR	
		or 2SD1292(QR)	TRANSISTOR	
	Q10	2SD1450S,T	TRANSISTOR	
		or 2SD1292(QR)	TRANSISTOR	
	Q11	DTA144ES	TRANSISTOR	
	D1	1SS133	DIODE	
	D2	1SS133	DIODE	
	D3	1SS133	DIODE	
	D4	1SS133	DIODE	
	D5	1SS133	DIODE	
	D6	1SS133	DIODE	
	R1	QRD161J-103	RESISTOR	10KΩ,1/6W
	R2	QVZ3518-103	V RESISTOR,SEPARATION ADJ	10KΩ
	R3	QRD161J-153	RESISTOR	15KΩ,1/6W
	R4	QRD161J-331	RESISTOR	330Ω,1/6W
	R5	QRD161J-821	RESISTOR	820Ω,1/6W
	R6	QRD161J-102	RESISTOR	1KΩ,1/6W
	R7	QRD161J-104	RESISTOR	100KΩ,1/6W
	R8	QRD161J-154	RESISTOR	150KΩ,1/6W
	R9	QRD161J-271	RESISTOR	270Ω,1/6W
	R10	QRD161J-273	RESISTOR	27KΩ,1/6W
	R11	QRD161J-103	RESISTOR	10KΩ,1/6W
	R12	QRD161J-103	RESISTOR	10KΩ,1/6W
	R13	QRD161J-103	RESISTOR	10KΩ,1/6W
	R14	QRD161J-103	RESISTOR	10KΩ,1/6W
	R15	QRD161J-103	RESISTOR	10KΩ,1/6W
	R16	QRD161J-103	RESISTOR	10KΩ,1/6W
	R17	QRD161J-103	RESISTOR	10KΩ,1/6W
	R21	QVZ3518-332	V RESISTOR, AUDIO L LEVEL	3.3KΩ
	R22	QRD161J-222	RESISTOR	2.2KΩ,1/6W
	R23	QRD161J-103	RESISTOR	10KΩ,1/6W
	R24	QVZ3518-332	V RESISTOR, AUDIO R LEVEL	3.3KΩ
	R25	QRD161J-222	RESISTOR	2.2KΩ,1/6W
	R26	QRD161J-103	RESISTOR	10KΩ,1/6W
	C1	QETC1CM-106	E CAPACITOR	10μF,16V
	C2	QFN31HK-392	M CAPACITOR	0.0039μF,50V
	C3	QFN31HK-392	M CAPACITOR	0.0039μF,50V
	C4	QFN31HK-392	M CAPACITOR	0.0039μF,50V
	C5	QETC1CM-106	E CAPACITOR	10μF,16V
	C6	QETC1CM-106	E CAPACITOR	10μF,16V
	C7	QETC1CM-476	E CAPACITOR	47μF,16V
	C8	QCF31HP-223	CAPACITOR	0.022μF,50V
	C9	QCC11EK-473	CAPACITOR	0.047μF,25V
	C10	QFP31HJ-102	M CAPACITOR	0.001μF,50V
	C11	QETC1CM-477	E CAPACITOR	470μF,16V
	C12	QCC11EK-473	CAPACITOR	0.047μF,25V
	C13	QETC1CM-106	E CAPACITOR	10μF,16V
	C14	QETC1CM-106	E CAPACITOR	10μF,16V
	C15	QETC1CM-336	E CAPACITOR	33μF,16V
	C16	QETC1CM-107	E CAPACITOR	100μF,16V
	C17	QETC1HM-105	E CAPACITOR	1μF,50V
	C18	QETC1CM-476	E CAPACITOR	47μF,16V
	C20	QETC1CM-106	E CAPACITOR	10μF,16V
	BPF1	PU58226	BAND PASS FILTER	
	CF1	PU52775	CERAMIC FILTER	
	CF2	PU52775-2	CERAMIC FILTER	
	T1	PU59489	COIL, SECOND AUDIO	
	T2	PU59490	COIL, DET BUZZ	
	CN1	PU58844-6	CAP HOUSING	
	CN2	PU59555-4	CAP HOUSING	
	CN3	PU59555-5	CAP HOUSING	

#△	REF No.	PART No.	PART NAME, DESCRIPTION	

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TIMER/DISPLAY//SW BOARD ASSEMBLY<20><28>

#△	REF No.	PART No.	PART NAME, DESCRIPTION	
	PWBA	PB10420B	T/D/S BOARD ASSEMBLY,E	
	PWBA	PB10420A	T/D/S BOARD ASSEMBLY,EG	

- TIMER BOARD ASSEMBLY<20> -

#△	REF No.	PART No.	PART NAME, DESCRIPTION	
	PWBA1	PB10420B1	TIMER BOARD ASSEMBLY,E	
	PWBA1	PB10420A1	TIMER BOARD ASSEMBLY,EG	
	IC1	UPD75217CW-032	IC	
		or UPD75P218CW032	IC	
	IC2	IC-PST523H-2	IC	
	Q1	2SC3199(G)	TRANSISTOR	
		or 2SC3311A(RS)	TRANSISTOR	
	Q3	DTC124ES	TRANSISTOR	
	Q4	DTC144ES	TRANSISTOR	
	D1	RD9.1ES-T1B2	ZENER DIODE	
	D2	1SS133	DIODE	
	D3	1SS133	DIODE	
	D4	11ES2	DIODE	
	D5	11ES2	DIODE	
	D7	1SS133	DIODE	
	D8	1SS133	DIODE	
	D24	1SS133	DIODE	
	D31	1SS133	DIODE,EG	
	D33	1SS133	DIODE	
	R1	QRD161J-103	RESISTOR	10KΩ,1/6W
	R4	QRD161J-682	RESISTOR	6.8KΩ,1/6W
	R5	QRD161J-333	RESISTOR	33KΩ,1/6W
	R6	QRD161J-333	RESISTOR	33KΩ,1/6W
	R7	QRD161J-102	RESISTOR	1KΩ,1/6W
	R8	QRD161J-103	RESISTOR	10KΩ,1/6W
	R9	QRD161J-103	RESISTOR	10KΩ,1/6W
	R10	QRD161J-103	RESISTOR	10KΩ,1/6W
	R11	QRD161J-103	RESISTOR	10KΩ,1/6W
	R12	QRD161J-333	RESISTOR	33KΩ,1/6W
	R13	QRD161J-271	RESISTOR	270Ω,1/6W

#△	REF No.	PART No.	PART NAME, DESCRIPTION	
	R14	QRD161J-271	RESISTOR	270Ω,1/6W
	R15	QRD161J-103	RESISTOR	10KΩ,1/6W
	R16	QRD161J-103	RESISTOR	10KΩ,1/6W
	R17	QRD161J-472	RESISTOR	4.7KΩ,1/6W
	R25	QRD161J-103	RESISTOR	10KΩ,1/6W
	R26	QRD161J-103	RESISTOR	10KΩ,1/6W
	R30	QRD161J-224	RESISTOR	220KΩ,1/6W
	R31	QRD161J-151	RESISTOR,E	150Ω,1/6W
	R32	QRD161J-271	RESISTOR	270Ω,1/6W
	R33	QRD161J-271	RESISTOR	270Ω,1/6W
	R36	QRD161J-103	RESISTOR	10KΩ,1/6W
	R38	QRD161J-104	RESISTOR	100KΩ,1/6W
	R40	QRD161J-271	RESISTOR	270Ω,1/6W
	R41	QRD161J-103	RESISTOR	10KΩ,1/6W
	R42	QRD161J-561	RESISTOR	560Ω,1/6W
	R43	QRD161J-472	RESISTOR	4.7KΩ,1/6W
	R44	QRD161J-472	RESISTOR	4.7KΩ,1/6W
	R45	QRD161J-472	RESISTOR	4.7KΩ,1/6W
	R49	QRD161J-103	RESISTOR	10KΩ,1/6W
	R50	QRD161J-103	RESISTOR	10KΩ,1/6W
	R51	QRD161J-103	RESISTOR	10KΩ,1/6W
	R52	QRD161J-103	RESISTOR	10KΩ,1/6W
	R53	QRD161J-472	RESISTOR	4.7KΩ,1/6W
	R54	QRD161J-472	RESISTOR	4.7KΩ,1/6W
	R55	QRD161J-472	RESISTOR	4.7KΩ,1/6W
	R56	QRD161J-271	RESISTOR	270Ω,1/6W
	RA1	QRB047J-333	RESISTOR ARRAY	
		or QRB049J-333	RARRAY	
	RA2	QRB047J-104	NETWORK RESISTOR	100KΩ,4W
		or QRB049J-104	NETWORK RESISTOR	100KΩ,4W
	C3	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C4	QER61CM-106	E CAPACITOR	10μF,16V
	C5	QEA40HZ-105	E CAPACITOR(DOUBLE),E	1μF,50V
	C5	QEA40HZ-104	E CAPACITOR(DOUBLE),EG	0.1μF,50V
		or PU60676-104	E CAPACITOR(DOUBLE),EG	
	C6	QAT3123-200	TRIMMER CAPACITOR,CLOCK	20PF
	C7	QCSB1HJ-120	CAPACITOR	12PF,50V
	C11	QER61CM-106	E CAPACITOR	10μF,16V
	C13	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C15	QCBB1HJ-101	CAPACITOR	100PF,50V
	C16	QCBB1HJ-101	CAPACITOR	100PF,50V
	C17	QCF11HP-473	CAPACITOR	0.047μF,50V
	C18	QER61CM-106	E CAPACITOR	10μF,16V
	C19	QER61CM-106	E CAPACITOR	10μF,16V
	C21	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C22	QCBB1HJ-151	CAPACITOR	150PF,50V
△	X1	PU60226-4	CRYSTAL RESONATOR	

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	K1	PU60281-5	FERRITE BEADS	
	TP1	PU56008	TEST-PIN	
	CN1	PU61044-13	CAP HOUSING	
	CN2	PU59555-9	CAP HOUSING	
	CN3	PU59555-7	CAP HOUSING	
	CN4	PU59555-7	CAP HOUSING	
	CN5	PU58798-11	CAP HOUSING	
	CN10	PU59555-11	CAP HOUSING	
⚠	CP1	ICP-F10	CIRCUIT PROTECTOR	

- SW/DISPLAY BOARD ASSEMBLY<28> -

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	PWBA2	PB10420B2	SW/DISP BOARD ASSEMBLY,E	
	PWBA2	PB10420A2	SW/DISP BOARD ASSEMBLY,EG	
	IC101	GP1U541X	INFRARED RAYS UNIT	
	IC102	MSC1195SS	IC	
	IC103	MSC7112-01SS	IC	
	Q101	2SK658	FE TRANSISTOR	
	Q201	2SB643S	TRANSISTOR	
	Q202	DTA114ES	TRANSISTOR	
	D101	11ES2	DIODE	
		or ERA15-02	DIODE	
	D202	SLH-56VC3F	LE DIODE	
	D203	SLH-56MC3F	LE DIODE	
	D204	SLH-56MC3F	LE DIODE	
	D229	1SS133	DIODE	
	R101	QRD161J-102	RESISTOR	1KΩ,1/6W
	R102	QRD161J-102	RESISTOR	1KΩ,1/6W
	R103	QRD161J-102	RESISTOR	1KΩ,1/6W
	R104	QRD161J-273	RESISTOR	27KΩ,1/6W
	R107	QRD161J-102	RESISTOR	1KΩ,1/6W
	R108	QRD161J-103	RESISTOR	10KΩ,1/6W
	R109	QRD161J-103	RESISTOR	10KΩ,1/6W
	R110	QRD161J-103	RESISTOR	10KΩ,1/6W
	R111	QRD161J-103	RESISTOR	10KΩ,1/6W
	R113	QRD161J-103	RESISTOR	10KΩ,1/6W
	R116	QRD161J-103	RESISTOR	10KΩ,1/6W
	R202	QRD161J-271	RESISTOR	270Ω,1/6W

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	R203	QRD161J-271	RESISTOR	270Ω,1/6W
	R204	QRD161J-271	RESISTOR	270Ω,1/6W
	R206	QRD161J-472	RESISTOR	4.7KΩ,1/6W
	R207	QRD161J-822	RESISTOR	8.2KΩ,1/6W
	R217	QRD161J-273	RESISTOR	27KΩ,1/6W
	R218	QRD161J-273	RESISTOR	27KΩ,1/6W
	R219	QRD161J-473	RESISTOR	47KΩ,1/6W
	C101	QCBB1HJ-101	CAPACITOR	100PF,50V
	C102	QER61HM-104	E CAPACITOR	0.1μF,50V
	C103	QER60JM-336	E CAPACITOR	33μF,6.3V
	C104	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C105	QER61VM-106	E CAPACITOR	10μF,35V
	C106	QEP60JM-226	NP E CAPACITOR	22μF,6.3V
	C107	QEP60JM-226	NP E CAPACITOR	22μF,6.3V
	C108	QER61CM-106	E CAPACITOR	10μF,16V
	C109	QFJ41HJ-223	M CAPACITOR	0.022μF,50V
	C110	QFJ41HJ-473	M CAPACITOR	0.047μF,50V
	C111	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C112	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C113	QER61VM-226	E CAPACITOR	22μF,35V
	C114	QETC0JM-337	E CAPACITOR	330μF,6.3V
	C115	QCSB1HJ-330	CAPACITOR	33PF,50V
	C116	QCSB1HJ-330	CAPACITOR	33PF,50V
	C117	QCF11HP-473	CAPACITOR	0.047μF,50V
	S18	PU60392-Z	TACT SWITCH,PROGRAM CLOCK ADJ	
	S21	PU60392-Z	TACT SWITCH,CANCEL/C.RESET	
	S22	PU60392-Z	TACT SWITCH,REPEAT/C.MEMO	
	S23	PU60392-Z	TACT SWITCH,SELECT	
	S24	PU60392-Z	TACT SWITCH,TIMER	
	S25	PU60392-Z	TACT SWITCH,SET+/TRACK+	
	S26	PU60392-Z	TACT SWITCH,SET-/TRACK-	
	S28	PU60392-Z	TACT SWITCH,DISPLAY OFF	
	S29	PU60392-Z	TACT SWITCH,CH SEARCH	
	S30	PU60392-Z	TACT SWITCH,VPS/CHSET	
	S401	PU59292	SLIDE SWITCH	
	S402	PU59292	SLIDE SWITCH,TV SOUND	
	S403	PU59292	SLIDE SWITCH	
	S404	PU59292	SLIDE SWITCH	
	S405	PU59299	SLIDE SWITCH,REPEAT	
	FDP1	PEDP0013-02	FLUORESCENT DISPLAY PANEL,EG	
	FDP1	PEDP0013	FLUORESCENT DISPLAY PANEL,E	
	CL1	PU59311-2	WIRE CLAMP	

#△ REF No.	PART No.	PART NAME, DESCRIPTION
HD1	PQM30038-1-2	LED HOLDER
HD2	PQ32934-1-1	FDP HOLDER(R)
HD3	PQ32933-1-1	FDP HOLDER(L)
SPC1	PU59210-002	W.LOKING SPACER
WR1	PW30101-40AAZZ7	PARALLEL WIRE(J1)
	or PW30115-40AAZZ7	PARALLEL WIRE(J1)
CN7	PU59555-3	CAP HOUSING
CN8	PU58844-7	CAP HOUSING
CN9	PU59555-5	CAP HOUSING

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JACK BOARD ASSEMBLY <36>

PWBA	PB20464A-02	JACK BOARD ASSEMBLY,EG	
PWBA	PB20464B-02	JACK BOARD ASSEMBLY,E	
D1	SLH-34VC3F	LE DIODE	
D35	1SS133	DIODE	
R1	PU61126	V RESISTOR,MIC MIX	
R2	QRD162J-103	RESISTOR	10KΩ,1/6W
R3	PU61016	V RESISTOR,H.P.VOLUME	
R4	PU61017	V RESISTOR,P.SHARPNESS	
R5	PU60652	SLIDE VR, REC LEVEL (L)	
R6	PU60652	SLIDE VR, REC LEVEL (R)	
LC1	PU59885-223	N FILTER,EG	
LC2	PU59885-223	N FILTER,EG	
S1	PU53598-2	TACT SWITCH,POWER	
S2	PU53598-2	TACT SWITCH,STOP/EJECT	
S3	PU59292	SLIDE SWITCH,PRE ROLL	
S4	PU59292	SLIDE SWITCH,EDIT	
S5	PU59296	SLIDE SWITCH,LEVEL IND	
K1	PU60281-5	FERRITE BEADS,EG	

#△ REF No.	PART No.	PART NAME, DESCRIPTION
CL1	PU43192-4	BINDER
CL2	PU59311-2	WIRE CLAMP,X2
HD1	PQ40795-1-2	LED HOLDER
J1	PU60664-3	MINI JACK
J2	PU60452-2	MINI JACK
CN1	PU59555-6	CAP HOUSING
CN2	PU59555-9	CAP HOUSING
CN3	PU59555-5	CAP HOUSING
CN4	PU58844-5	CAP HOUSING
CN5	PU58844-3	CAP HOUSING
CN6	PU59555-3	CAP HOUSING
CN7	PU58844-2	CAP HOUSING

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PRE/REC AMP BOARD ASSEMBLY <43>

PWBA	PB10396A	PRE/REC BOARD ASSEMBLY	
IC1	AN3386NK-A	IC	
Q1	2SA1576(QRS)	TRANSISTOR	
Q2	2SC4081(QRS)	TRANSISTOR	
Q3	2SC4081(QRS)	TRANSISTOR	
Q4	DTC144WU	TRANSISTOR	
Q5	DTC144WU	TRANSISTOR	
Q6	DTC144WU	TRANSISTOR	
D1	1SS133	DIODE	
	or MA165	DIODE	
D2	MA141K	DIODE	
D4	1SS133	DIODE	
	or MA165	DIODE	
R1	QRSA08J-102YN	RESISTOR	1KΩ, 1/10W
R2	QRSA08J-222YN	RESISTOR	2.2KΩ, 1/10W
R3	QRSA08J-222YN	RESISTOR	2.2KΩ, 1/10W
R4	QRSA08J-391YN	RESISTOR	390Ω, 1/10W
R5	QRSA08J-391YN	RESISTOR	390Ω, 1/10W

#△	REF No.	PART No.	PART NAME, DESCRIPTION	
	R6	QRSA08J-821YN	RESISTOR	820Ω,1/10W
	R7	QRSA08J-222YN	RESISTOR	2.2KΩ,1/10W
	R8	QRSA08J-222YN	RESISTOR	2.2KΩ,1/10W
	R9	QRSA08J-821YN	RESISTOR	820Ω,1/10W
	R10	QRSA08J-102	RESISTOR	1KΩ,1/10W
	R11	QRSA08J-122YN	RESISTOR	1.2KΩ,1/10W
	R14	QRSA08J-122YN	RESISTOR	1.2KΩ,1/10W
	R15	QRSA08J-562YN	RESISTOR	5.6KΩ,1/10W
	R16	QRSA08J-153YN	RESISTOR	15KΩ,1/10W
	R17	QRSA08J-562YN	RESISTOR	5.6KΩ,1/10W
	R18	QRSA08J-562YN	RESISTOR	5.6KΩ,1/10W
	R19	QRSA08J-334YN	RESISTOR	330KΩ,1/10W
	R20	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
	R21	QRSA08J-393YN	RESISTOR	39KΩ,1/10W
	R22	QRSA08J-153YN	RESISTOR	15KΩ,1/10W
	R23	NRVA02D-4872AY	RESISTOR	48.7KΩ,1/10W
	R24	QRSA08J-914YN	RESISTOR	910KΩ,1/10W
	R25	QRSA08J-562YN	RESISTOR	5.6KΩ,1/10W
	R26	QRSA08J-331YN	RESISTOR	330Ω,1/10W
	R27	QRSA08J-471YN	RESISTOR	470Ω,1/10W
	R28	QRSA08J-271YN	RESISTOR	270Ω,1/10W
	R29	QRSA08J-331YN	RESISTOR	330Ω,1/10W
	R30	QRSA08J-104YN	RESISTOR	100KΩ,1/10W
	R31	QRD161J-474	RESISTOR	470KΩ,1/6W
	R51	QRSA08J-471YN	RESISTOR	470Ω,1/10W
	C1	QER60JM-476	E CAPACITOR	47μF,6.3V
	C2	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C3	QCSA1HJ-681	CAPACITOR	680PF,50V
	C4	QCSB1HJ-180	CAPACITOR	18PF,50V
	C5	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C7	QCSA1HJ-270	CAPACITOR	27PF,50V
	C8	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C9	QCSA1HJ-680	CAPACITOR	68PF,50V
	C10	QCSA1HJ-471	CAPACITOR	470PF,50V
	C12	QCSA1HJ-680	CAPACITOR	68PF,50V
	C13	QCFA1EZ-104	CAPACITOR	0.1μF,25V
	C14	QCSA1HJ-391	CAPACITOR	390PF,50V
	C15	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C16	QER61CM-476	E CAPACITOR	47μF,16V
	C18	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C19	QCFA1EZ-104	CAPACITOR	0.1μF,25V
	C20	QCSA1HJ-151	CAPACITOR	150PF,50V
	C21	QCSA1HJ-271	CAPACITOR	270PF,50V
	C22	QCSA1HJ-101	CAPACITOR	100PF,50V
	C23	QCSA1HJ-101	CAPACITOR	100PF,50V
	C24	QCY81EK-104	CAPACITOR	0.1μF,25V
	C25	QCY81EK-104	CAPACITOR	0.1μF,25V
	C26	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C27	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C28	QCY81EK-104	CAPACITOR	0.1μF,25V
	C29	QCY81EK-104	CAPACITOR	0.1μF,25V
	C30	QER61AM-685	E CAPACITOR	6.8μF,10V
	C31	QCF81EZ-224	CAPACITOR	0.22μF,25V
	C32	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C33	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C38	QCSA1HJ-2R0	CAPACITOR	2PF,50V
	C42	QCSA1HJ-560	CAPACITOR	56PF,50V
	C51	QCSA1HJ-180	CAPACITOR	18PF,50V
	C52	QCSA1HJ-5R0	CAPACITOR	5PF,50V
	C53	QCC11CJ-683	CAPACITOR	0.068μF,16V
△	L1	PU54223-101K	COIL	100μH
	L2	PU59988-560JY	COIL	56μH
	L3	PU59988-220JY	COIL	22μH
	L4	PU59988-560JY	COIL	56μH
	L5	PU59988-470JY	COIL	47μH
	L6	PU59988-121JY	COIL	120μH
	L7	PU59988-330JY	COIL	33μH
△	L8	PU54223-470K	COIL	47μH
	SLD1	PQ33472	SHIELD CASE(1)	
	CN1	PU58844-106	CAP HOUSING	
	CN2	PU59555-106	CAP HOUSING	
	CN3	PU58844-104	CAP HOUSING	
	CN4	PU59974-13	CAP HOUSING	
	CN5	PU58844-3	CAP HOUSING	

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DECK TERMINAL BOARD ASSEMBLY <51>

PWBA	PB10320A-02	DECK TERMINAL BOARD ASSY	
Q1	PU60625	END SENSOR	
R1	QRD161J-202	RESISTOR	2KΩ,1/6W
R3	QRD161J-331	RESISTOR	330Ω,1/6W
R4	QRD161J-331	RESISTOR	330Ω,1/6W
R5	QRD161J-331	RESISTOR	330Ω,1/6W
R7	QRD161J-202	RESISTOR	2KΩ,1/6W
R8	NTH5D473KB or ERT-D2ZHK473S	THERMISTOR NEGA THERMISTOR	
C1	QCVB1CM-103	CAPACITOR	0.01μF,16V

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
PS1	PS5705HR	PH INTERRUPTER, TAKE UP	
PS2	PS5705HR	PH INTERRUPTER, SUPPLY	
CN1	PEMC0722-017	WIRE TRAP	
	or PEMC0753-017	WIRE TRAP	
CN2	PU60642	CONNECTOR,(7PIN)	
CN3	PU60640	CONNECTOR,(4PIN)	

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LOADING MDA BOARD ASSEMBLY <55>

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
PWBA2	PB10320A2-01	LOADING MDA BOARD ASSY	
⚠ IC1	BA6418N	IC	
⚠	or XRA6418N	IC	
C1	QETA1CM-336	E CAPACITOR	33μF,16V
CN1	PU59555-104	CAP HOUSING	

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CASSETTE HOUSING BOARD <56>

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
PWB1	PB40041-01-01	CASSETTE HOUSING BOARD	
Q2	PN268VI-NC	PHOTO TRANSISTOR	
C1	QCC11EJ-103	CAPACITOR	0.01μF,25V
PHS3	PU60629	CASS.SENSOR	
CN2	PU60639	CONNECTOR(4PIN)	

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UPPER DRUM BOARD 1/2 <62><63>

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION
PWB1	PDM3161	BOARD (UPPER DRUM), X2

SECTION 6
TECHNICAL INFORMATION

6.1 CIRCUIT CONTROL SYSTEM

1. Mechacon CPU pin function (IC601)

Pin No.	Symbol	I/O format	Label	IN/OUT	Contents
1	Vcc	—	Vcc	I	for the system control, DC 5V
2	VREF	—	Vref		
3	DA	Analog	LCM 1	O	LOADING MOTOR DRIVE
4	PWM	PWM	LCM 2		
5	Port 6 4	N-ch OPEN DRAIN	AVRG FM	I	AUTO TRACKING DATA INPUT
6	3		R. PAUSE IN	I	REMOTE PAUSE CONTROL
7	2		THERM	I	THERMIC CORRECTION (CAPSTAN BREAK TIMING CONTROL)
8	1		MODE SENS B	I	MECHANISM MODE DETECT
9	0		MODE SENS A		
10	AN 7	Analog	MODE SENS C		
11	6		REC SAFETY	I	DETECTS ERASE PROTECT TAB (TAB ABSENT: H)
12	5		START SENS	I	START SENSOR, READER TAPE DETECT (ON: L)
13	4		DRUM CTL V	O	DRUM MOTOR DRIVE VOLTAGE SERVO
14	Port 4 3	N-ch OPEN DRAIN	CAP CTL V	O	CAPSTAN MOTOR DRIVE VOLTAGE SERVO
15	2		CASS SENS	I	CASSETTE SENSOR (CASS IN)
16	1		END SENS	I	END SENSOR, TRAILER TAPE DETECT (ON: L)
17	0		D FF	I	DRUM FF, REC TIMING CONTROL/DRUM ROTATION DETECT
18	Port 3 7	N-ch OPEN DRAIN	CTL PULSE	I	MODE (SP/EP/LP) DETECT/BLANK DETECT
19	6		V UP	O	CAPSTAN SPEED CONTROL (X11 MODE: H)
20	5		V PULSE	O	V PULSE OUTPUT (SPECIAL PLAYBACK)
21	4		A/M/S	O	HEAD SELECT SIGNAL OUTPUT
22	3		FADE	O	FADER CONTROL (FADER MODE ON: L)
23	2		PREROL	O	PREROL FUNCTION CONTROL
24	1		SUP FG	I	REEL ROTATION DETECT/TAPE REMAIN DATA
25	0		TU FG		
26	$\overline{\text{INT-1}}$	—	CAP FG	I	MODE (SP/EP/LP) DETECT/BACK SPACE COUNT
27	CN Vss		CN Vss		(ALWAYS) GND
28	$\overline{\text{RESET}}$		RESET		RESET AT CONNECT VCR TO AC
29	X IN		X IN	I	MAIN SYSTEM CLOCK (4 MHz)
30	X OUT		X OUT	O	
31	ø		NC	—	NC
32			Vss	—	GND
33	Port 5 7	with Input Latch	HiFi RECST	O	HiFi REC START: L
34	6		REC START	O	REC START: L
35	5		SP	O	MODE CONTROL (SP MODE: H)
36	4		DO CTL	I	FM A DETECT
37	3	High Impedance	P MUTE	O	PICTURE MUTE CONTROL: H
38	2		A MUTE	O	PICTURE MUTE CONTROL: H
39	1		FE H CTL		FLYING ERASE HEAD CONTROL L (ON: H)
40	0		P CTL		POWER CONTROL (ON: H)
41	Port 1 7	N-ch OPEN DRAIN	EE	O	EE MODE: H
42	6		A REC ST	O	AUDIO REC START ON: H
43	5		AUX		INPUT SELECT (AUX MODE: L)
44	4		EXP DATA	O	12 6 bit SERIAL DATA
45	3		FULL ERASE		FULL ERASE ON: H (CPU SUB PORT)
46	2		A REC		AUDIO REC: H
47	1		CH SEL		AUDIO CHANNEL SELECT (L/ST/R)
48	0		MON SEL		AUDIO MONITOR SELECT (HiFi/NORM/MIX)
49	Port 0 7	N-ch OPEN DRAIN	INPUT SEL	O	INPUT SELECT
50	6		TU CTL		TUNER MODE CONTROL
51	5		M DATA	I/O	MEMORY DATA CONTROL (READ/WRITE)
52	4		M CE	O	MEMORY IC CONTROL (CHIP ENABLE)
53	3		L MUTE	O	DEMODU MUTE (ON: H)
54	2		PLL DATA	O	PLL TUNING DATA (18 bit)
55	1		S CLOCK	O	CLOCK (COMMON)
56	0		S DATA	O	SERVO IC CONTROL DATA
57	Port 2 7	C MOS	SYNC DET	I	SYNC DETECT (NO SIGNAL: H)
58	6		LOCK	I	TUNING DATA OUTPUT CHECK
59	5		INDEX	O	INDEX DATA WRITE/READ CONTROL (VISS) (ON: L)
60	4		PAUSE	O	CAPSTAN MOTOR SERVO
61	3		SERVO	O	〃
62	2		T DATA	I/O	TM (TIMER/M-CTL CPU) bus DATA (16 bit)
63	1		T CLK	I	CLOCK (TM bus)
64	0		CAP REV	O	REV MODE: L

Table 6-1 Mechacon CPU pin function

2. Timer CPU pin function (IC1)

Pin No.	Symbol	Label	I/O	Contents
1	S3	Sd	O	KEY SCAN PULSE OUTPUT
2	S2	Sc	–	NC
3	S1	Sb	O	KEY SCAN PULSE OUTPUT
4	So	Sa		
5	P00/INT4	POWER DOWN	I	POWER DOWN DETECT (DETECT NO: L)
6	P01/SCK	OS/DISP CLK	O	CLOCK
7	P02/SD	OS/DISP DATA		ON SCREEN DATA (8 bit)/DISPLAY DATA OUTPUT
8	P03/S1	TEST	I	TEST POINT (CLOCK ADJUST/FDP CHECK/X10 SPEED set)
9	P10/INT0	REMOTE	I	REMOTE DATA 16 bit SERIAL DATA (A/B code)
10	P11/INT1	NC	–	NC
11	P12/INT2	CNT PLS	I	COUNTER DATA
12	13/T10	CNT PLS		
13	P20	KS0	I	KEY SCAN DATA INPUT
14	P21	KS1		
15	P22	KS2		
16	P23/BUZ	KS3		
17	P30	M/C DATA	I/O	TM (TIMER/M-CTL CPU) bus : 16 bit DATA
18	P31	M/C CLK	O	: CLOCK
19	P32	SDA	I/O	VIDEO PROGRAMING SYSTEM: $\mathrm{I^2C}$ Bus
20	P33	SCL	O	VIDEO PROGRAMING SYSTEM: CLOCK
21	P60	OS CS	O	ON SCREEN CHIP SELECT
22	P61	OS RESET		ON SCREEN IC RESET
23	P62	DISP CE		DISPLAY CHIP ENABLE
24	P63	NC	–	NC
25	P40	POWWER	O	LED DRIVE (LED ON: L)
26	P41	VIDEO		VIDEO MODE: H
27	P42	SC		SIMULCAST MODE: H
28	P43	PROG		PROGRUM BLUE BACK/MODE: H
29	PRO	NC	–	NC
30	X1	X1	I	MAIN SYSTEM CLOCK (4.19 MHz)
31	X2	X2	O	
32	Vss	Vss	O	GND
33	XT1	XT1	I	GND (ALWAYS GND)
34	XT2	NC	–	NC
35	P50	JS/B	I	JOG DIAL PULSE INPUT
36	P51	SHUTTLE		SHUTTLE SW (H: NO OPERATION)
37	P52	JS/A	O	JOG DIAL PULSE INPUT
38	P53	NC	O	NC
39	RESET	RESET	I	RESET AT CONNECT VDR TO AC
40	T0	NC	–	NC
41	T1	NC		
42	T2	NC		
43	T3	NC		
44	T4	NC		
45	T5	NC		
46	T6	NC		
47	T7	NC		
48	T8	NC		
49	T9	NC		
50	T10/S15/PH3	SP	O	KEY SCAN PULSE OUTPUT
51	T11/S14/PH2	So		
52	T12/S13/PH1	Sn		
53	T13/S12/PH0	Sm		
54	T14/S11	Sl	–	NC
55	T15/S10	Sk		
56	VLOAD	VLOAD	I	−30 V For the FDP DRIVE
57	VPRE	VPRE		−5 V
58	S9	Sj	–	NC
59	S8	Si		
60	S7	Sh	O	KEY SCAN PULSE OUTPUT
61	S6	Sg		
62	S6	Sg		
63	S4	Se		
64	VDD	VDD	–	5 V For the SYSTEM CONTROL

Table 6-2 Timer CPU pin function